Introductory
MILITARY SCIENCE

"DEFENCE, ITS ARMY, IS TO A NATION
THE VERY ESSENCE OF ITS EXISTENCE."

INTRODUCTORY
MILITARY SCIENCE

EDITED BY

SHRI P. S. SARMA

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PREFACE

A subject known as 'Military Science' is being taught in different universities of our country since independence. Besides these curricular syllabi students and young men and women of our country are also being taught the subject through the National Cadet Corps and the Territorial Army. The subject of Military Science is interesting and also duly attracting a large number of pupils. But this enthusiastic community of young men and women are suffering from the crisis of available books on the subject.

In countries like U. K. and U. S. A. people interested in the subject get a plenty of books ready at their hands. These books not only help to sustaint he love for the subject but also help to develop a group of civil people thoroughly conversant with the intricacies and problems of the subject. The later mentioned help is not only great but also essential, specially at the present age, to create the civil defence of the same.

Some books of foreign publications are also available in our country at times. But the number of the available books or the contents of those fail to meet the needs and quests of our youth community. Requests from the students of the subject were received duriug last few years for some guides or books on the subject. After much thought and scrutiny the present venture has been taken to extend a helping hand to the young community. But it is not being claimed that this book is competent to meet all the questions, it has only touched a few basic points.

Regardful reference must be made of Prof. H. Biswas for help. Shri B. Mitra, the publisher, must be thanked for his audacious and timely venture.

Independence Day *P. S. S*
1960

A FEW WORDS FOR THE THIRD EDITION

The editor, as also the publisher express their thanks and compliments to all of them who have extended their patronage and support to the first and second editions of this primer by help and constructive criticisms. We hope that this new edition of ours will also have the good fortune of receiving similar affection.

It is needless to mention that the importance of studying 'Military Science' has increased during this national emergency for all Indians. Keeping this idea in view we have added some more new chapters in this book and have also edited some old chapters. We are very much aware that there are still rooms for further improvement, so we will be only glad and oblig d if specific suggestions are sent to us.

P. S. S

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In memory of my father

1

OUR ARMY

1. Introduction

The nucleus of the modern Indian Army was first organized by the British East India Company. Though armies were in India even before that, a continued central control over one army was only of temporary occurrence during the reigns of some very powerful emperors. The East India Company organized armies to protect their trading stations in three presidencies of Bengal, Madras and Bombay. The armies of these three zones were different from each other in many aspects, though the Company issued instructions with a view to make them similar in the broad lines. In 1748, they were placed for the first time under the control of one commander-in-chief, *Major Stringer Lawrence.* These troops of East India Company's Indian Army were not supplied with dress or weapons by the company, so they had to make their own arrangements for dress and weapons. These troops were commanded by Indian officers. In 1754 *Royal troops* were brought in Bombay from England. This introduced a new element in the then Indian Army which was hereafter divided into *King's troops, Company's European troops* and *Company's Indian troops.* This arrangement continued for more than one hundred years.

Shortly before the *Battle of Plassey* (1757), *Clive* reorganized the troops into regular battalions and the dress was changed to European type of uniform.

In the closing years of the 18th century a *Regimental system* was introduced. Each Regiment had usually two battalions. But this system did not work smoothly and was soon withdrawn ; and single battalion Regiments were reverted to in 1824. However, one of the old defects—the high proportion of British officers in each battalion--still remained.

At about 1824 irregular cavalry came into existence. The local rulers and nobles were made chiefs of these units and were designated as *Sillidar,* while the men used to provide their own horses, dresses and other requisites for which they used to get certain amount of financial aid. According to *Victor Bailey* this system of Army originated from the *Russian Horde.* He says that though the discipline of these soldiers were elastic, yet they were magnificient soldiers and they performed miraculous heroic achievements.

With the expansion of territory under the command of the Company, troops of local people for a particular service in certain areas were raised. Of these the notable ones are the *Hyderabad Contingent* and the *Punjab Frontier Force.* The Punjab Frontier Force, abbreviated to P. F. F., and nicknamed *Piffers,* rose to romantic fame.

The troops were modelled on the Royal Army lines. Since the time of *Marlborough* the British soldiers were gaining success and fame and so it was believed in those days British soldiers were the best models to be followed. The Indian troops were also organized more and more in the British line, without showing any sympathy or respect for the local climatic needs and popular sentiments.

There was also a gulf of difference between the pay and allowances of the officers and men of European troops and those of Indian officers and men. "The cost of the entire army in India amounts to 315,520 men costing £ 9,892,235. Out of this sum no less £ 5,668,110 are expended on 51,316 European officers and soldiers."

2. Sepoy Mutiny

The difference in treatment, the torture on the religious and cultural sentiment of Indian soldiers and other similar reasons coupled with the confidence that the British Generals were not invincible, rather they can be put to ignonimity by a purely Asian force led by Asian officers as was well manifested by Bharatpur, Nepal and Afgan wars caused Indian soldiers to revolt in 1857. This disturbance is known as *Sepoy mutiny.* Historians differ in opinion regarding the nature of the movement ; some people are keen to describe this as the first movement against British rule while others say that it was only pure mutiny. Whatever may be the nature, the flame spread all over the British India and the British people suffered heavily. But as soon as the movement was subdued, the European troops also took a heavy toll.

3. British Empire

This movement brought a change in the history of India. The terriory of the East India Company was taken over by the British Crown and India became a colony. The immediate effect of this change was that the century old distinction between 'Royal troops' and 'Company's European troops' disappeared. In 1861 a general reorganization of Indian troops was undertaken. Some units were disbanded and some others amalgamated and almost all Indian Artillery were abolished. The number of British officers was reduced ; and three Presidency Staff Corps were introduced. By 1880 abolition of the Presidency Armies were recommended and a series of changes took place. In 1886, Infantry battalions were grouped in pairs and allotted permanent Regimental Centres. In the Regimental Centres one or both the units could be located and new recruits were enrolled and trained for any one or both the units. Thus some sort of *espirit-de-corps* was initiated. At last, in 1895 the Presidency Armies were abolished and Geographical Commands were established. But the system of an expensive and complicated administration and existence of separate armies still remained.

4. Lord Kitchener's reformations

Lord Kitchener became the Commander-in-Chief in 1902 and he observed that the Indian troops were distributed all over the country without having any master plan for defence or administration of the British India. Immediately he started reformation and reorganization in the armed forces. In 1903 he abolished 'Indian Staff Corps' and the officers belonging to that corps were designated 'Officers of the Indian Army'. In the same year the responsibility of Burma was separated from the Madras Command and a separate independent Command called 'The Burma Command' was created. This Burma Command was entrusted with the entire responsibility of defence and administration of Burma. The Hyderabad contingent was abolished and its cavalry components were amalgamated with the Bombay Command while the Infantry units were brought under the control of the Madras Command ; and some other major reforms were made.

Lord Kitchener enumerated the four following principles on which his reformations were based :

(1) The main function of the army was to defend the North-West Frontier against an aggressive enemy.

(2) The organization, distribution and training of the army in peace time should be in units of commands similar to field or fighting formations.

(3) The maintenance of internal security was essential to set free the field army to carry out its functions.

(4) All army units should be so balanced and trained that they can carry out all the roles of the army in all spheres of activities ; all units should be given equal chances of experience and training.

In the year 1903 a memorandum dealing with '*The Reorganization and Redistribution of the Army in India*' was published. Further progress was made in the following year, and another memorandum, '*The Preparation of the Army in India for war*', was published in 1904. These two memoranda contained the proposals to do away with the four existing commands and their substitution by two 'armies'—The Northern Army' and 'The Southern Army'. The Northern Army was composed of five division while the Southern Army had four divisions.

Earlier *Kitchener* also did away with all regimental titles and designations that contributed, by a past association or otherwise to cast any derogatory imputation regarding the fighting fitness of regiments, and issued new numbers and designations to all units of the Army in India. *Lord Kitchener* took another important calculated step—he eliminated the units raised from the *non-*

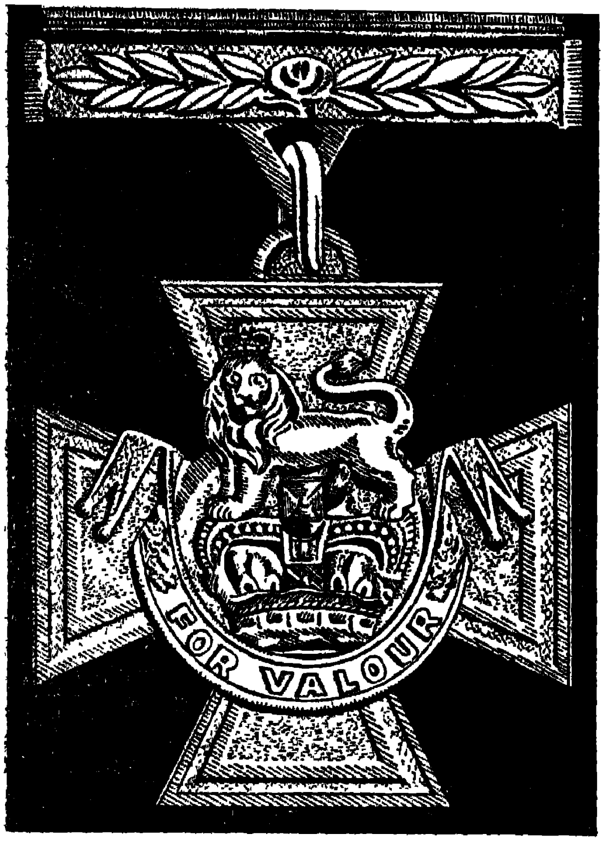


Fig. 1 : Victoria Cross

martial races and replaced those units by the newly raised units from the *martial races*. In accordance with this step nine *Madrasi* regiments were replaced by *Punjabis* and five others by *Gurkhas*.

5. Staff College

An inevitable consequence of the reformations made by Kitchener was felt in the form of a shortage of staff officers. So a *Staff College* was established in *Deolali* in 1905, but in 1907 the institution was shifted to *Quetta*.

The primary functions of the then Indian Army were two-fold—(*i*) the maintenance of peace within India and on the borders ; (*ii*) provision of field armies capable of undertaking any campaign beyond the border, should necessity demands it.

6. First World War

With the outbreak of *First World War* Indian troops were sent to different theatres of war such as, France, Belgium, Gallipoli, Salonika, Palestine, Egypt, Sudan, Mesopotamia, Aden, Somaliland, East Persia, North China and the North-west and North-east Frontiers of India, and earned distinction for bravery and skill. The finesse of the performance of the Indian soldiers can easily be estimated by the number of awards they won. In all they earned 12,908 awards which included British, French, Italian Belgian, Russian, Egyptian, Siberian, Rumanian decorations. A good number of soldiers also received *Victoria Cross* for valour.

During the First World War Indian troops were put in test for the first time. It was then felt that Indian Army required more equipment and stronger organization. To remove the administrative weakness many ways were tried.

In 1917, the *Indian Munitions Board* with *Sir Thomas Holland* as its president was established. The Board was responsible for (a) the controlling the supplies and demands of articles from U.K. and U. S. A ; (*b*) the supply of large quantities of plant materials to the Middle East, East Africa and also to the Govt. of India ; (*c*) the development of industries and manufacture. The Board ultimately took over the entire organization of all Govt. ordnance, clothing, hide and leather factories.

7. After First World War

After restoration of peace in 1918 the *Indian Soldiers' Board* was created under the presidentship of *Sir George Lowndes* for the welfare and care of the families of the soldiers who died in the First World War. This board also erected the *Imperial Memorial* at Delhi, to commemmorate the achievements of the soldiers of India and to pay tribute to the memory of the men who had fallen. In laying the foundation stone of the Imperial Memorial the *Duke of Connaught* said, "From the crowded records, here and there, certain leaders stand clearly out arresting the attention and admiration of the world to-day, and claiming with confidence the verdict of posterity........True to their traditions they answered the call with soldierly discipline and fortitude."

In appreciation of the endurance and amazing performances of Indian troops the title '*Royal*' was conferred on 'The Deccan Horse', '3rd Sappers and Miners', '5th Gurkha Rifles', '6th Jat Light Infantry', '34th Sikh Pioneers', '39th Garhwal Rifles , '59th Scinde Rifles' and '117th Mahrattas'. The '47th Sikhs' were glorified by the appointment of the *Duke of Connaught* as its Colonel-in-Chief.

In 1919 a committee, *Army in India Committee*, was organized under the chairmanship of *Lord Esher* to improve the administrative efficiency. After careful scrutiny of relative strength and financial limitations the committee suggested (1) an improved system of command and distribution of troops; (2) proper balance between the fighting arms and supporting services; (3) the maintenance of machinery in peace to provide for rapid expansion and re-inforcement in war, and (4) to organize and equip the Indian Army in accordance with modern European standards. Esher Committee were mainly responsible for improving the terms of service of Indians in the Army. Consequent to the recommendations of this committee the Indian soldiers and the Indian officers holding the *Viceroy's Commission* were fed, clothed, and housed by the state; their scales of pay and pensions were also improved.

The process of reorganization, as recommended by this committee, particularly in its more technical and specific aspects, was complicated and laborious. Still that continued. But in 1922 *Lord Inchape's Retrenchment Committee* compelled to reduce the strength of Indian Army mainly on financial reasons. But from military point of view the decision was unsound.

Though during the time of East India Company, Indians were trusted with commanding responsibility but during the reign of the Crown, Indian officers were only taken in medical and other supporting branches rather than fighting forces. A peculiar system of officering of the Indian Army was in existence. The superior officers in each Regiment were British—who were commissioned by the King of England. Indian officers on the other hand were commissioned by the Viceroy of India and were called Viceroy's Commissioned Officers (V.C.O.). The highest rank of V.C.O. was junior to the juniormost officer holding King's Commission.

8. Indianization of Officers

After the First World War a wave of movement for admitting Indians in King's Commissioned service was created by *Lt. Gen. Sir George Machmunn* and later by *Montagu-Chemisford. Sir K. G. Gupta, Sir P. S. Sivaswamy* are the notable Indians who took bold and courageous steps to induce 'Indianization of the Army in India'. *Sir P. S. Siwaswamy* made special study on the problems of defence of India and prepared fifteen resolution, known as *'Siwasuamy resolutions'*, and compelled the then Central Legislative Assembly to take emphatic actions on them.

After prolonged constitutional struggle and discussions ten seats were reserved for Indians at *Sandhurst* training centre. But effective Indianizations of the officers was started by establising the *Prince of Wales' Royal Indian Military College* (at present *Military College*) at *Dehra Dun,* which was opened by the *Prince of Wales* on the 13th March, 1922. Two types of Commission—King's Commission and Viceroy's Commission—were being conferred to Indians. This is a unique peculiarity of the Indian Army.

EIGHT UNIT SCHEME

In February, 1923, *Lord Rowlinson,* the then Commander-in-Chief, announced in the Legislative Assembly, his famous *Eight Unit Scheme.* According to this scheme eight units were scheduled to be completely officered by Indian officers holding King's Commission. Indianization of these units were contemplated to be completed by 1946.

In 1925 a committee, commonly called *'The Indian Sandhurst Committee'* under the presidentship of *Maj. Gen. Sir Andrew Skeen* was appointed to formulate the ways and means to improve the supply of Indian candidates for the King's Commissioned ranks. The committee favoured the expansion of the scope of employments of Indian officers by increasing the vacancies for Indians at Sandhurst, so long the military institutions are not established in India with the same standard, but this committee recommended that the 'Eight Unit Scheme' be abandoned. The recommendations of the committee were accepted and Indians were also admitted to the training centres at *Woolwich* and *Carnell.* The Indianization of officers were progressing steadily, though very slowly. By 1929 the number of Indian officers holding King's Commission was only 92.

At about the same time, a committee of the chiefs of Indian Feudatory States together with experts from the Central Government of India, evolved a scheme which gave the troops, commanded by the Indian States, a new shape and form, and designated them as *'The Indian States Forces'*. Since then officers and men of the Indian States Forces were trained in the same schools and institutions with the people of Indian Army.

NEHRU REPORT

In 1928 a committee appointed by All Parties Conference made a report on the question of the Army in relation to the development of the Indian Self-Government. This report is commonly called as *Nehru Report.* The authors of the report quoted the pungent remarks of *Prof. Keith,* 'Self-Government without an effective Indian Army is an impossibility.' British reactions, as contained in the report of the *Indian Statutory Commission,* was that the recommendations of Nehru report were not realistic and fundamentally different from the problems of Indian defence.

Whatever reformations and reorganizations were made, there was no provision for the army in India, in the Government of India Act till the time of *Round Table Conference,* held in 1931. At that time *Mahatma Gandhi, Sir Tejbahadur Sapru* and *Pandit Madanmohan Malaviya* were advocating very strongly for an Indian minister responsible to the legislature of India and having total controlling authority over the Indian Armed Forces. But British Government could not appreciate the point till 1933, when the *War office* accepted that India should assume responsibility for the maintenance of internal security while the War office would hold the responsibility of defending India from external aggression.

In 1936 a committee under the chairmanship of *Major C. J. Auchinleck* announced that the Army in India was falling behind the forces even of minor states like Egypt, Iraq and Afghanistan. An expert committee under the chairmanship of *Lord Chatfield* scrutinized the reports of Auchinleck Committee ; and in 1939 British Government expressed her preparedness for modernization of the Indian Army. A '*Five Year Plan*' for improvement of Indian Armed Forces was then put into rapid operation. In April, 1939 the *Indian Army Ordnance Corps* (*I A O C*) assumed the responsibilities for maintenance and repair of all mechanized vehicles. A very rapid development was then witnessed in all directions. The developmental activities were not only restricted to Indian Army but it extended to all armed forces.

9. Second World War

At the time, when the *Second World War* crashed on earth, India had a fine professional army with colourful traditions but wholly inadequate to meet the challenge of the modern warfare. The total strength of the Indian Army stood at 1,77,000, excluding the State Forces ; and it had no armoured forces and very little of artillery. A tempo of rapid expansion and improvement of the Indian Armed Forces was only increasing at that time. The speed of development can easily be judged by the fact that India sent *a quarter million* soldiers to the western frontiers during 1939—41. The rapid expansion compelled to modify the composition of the Army. So long people were entrolled in Army only from so-called *martial classes,* but by then, to meet the necessity the doors of army were also opened to all Indians.

During this phenomenal growth of Indian Armed Forces the process of Indianization of officers also accelerated. New academies and institutions were established at different places of India. *Emergency Commissions* were being conferred on many Indians. The ever-increasing demand of war also quickened up the promotions of *Viceroy's Commissined Officers* and *Non-Commissioned Officers.*

During this war Indians fought in Africa, Abyssinia, Arakan, Assam, Burma, Greece, Hongkong, Iraq, Italy, Java, Malaya, Somaliland, and Syria.

Indians once again proved their quality as fighting people—they specially distinguished themselves in the *Western Desert, Eritrea, Syria, Abyssinia,* and lately in *Assam* and *Burma.* Many new arms were organized during the period of Second World War, mention must be made of *Paratroops, Indian Observation Corps, Army Medical Corps, Queen Alexandra's Imperial Military Nursing Service, Corps of Indian Electrical and Mechanical Engineers, The Women s Auxiliary Corps (India)*, etc. During the same period India also saw establishment of many stations, workshops and centres in order to improve the armed forces of India.

AZAD HIND FAUJ

During the Second World War the Indian soldiers who were taken as Prisoners of War by Japanese organized '*Azad Hind Fauj* (Indian National Army)' under the leadership of *Netaji Subhas Chandra Bose.* This newly organized Fauj was fighting against the British from the other side of the frontiers for liberation of India. Though this Fauj was ill-equipped yet it was able to push back the British and for a short period liberated *Arakan*, where the Indian tricolour was unfurled by *Maj. Gen. Shah Newaj.* But news regarding this Fauj did not reach Indians before the end of the war. It is only in 1946 the complete story of it was unfolded in Red Fort during the trial of its few leaders. By the brilliant advocacy of *I. N. A. defence council* headed by *Shri Bhulabhai Desai*, the British Government suffered a legal defeat and people of the Fauj were entitled as 'patriots and fighters for national freedom'. The illustrious example of Azad Hind Fauj was followed by wholesale revolt by naval personnel for independence of India. The revolution was pacified when *Sardar Vallabbhai Patel* accepted the leadership and guided the movement to the direction of achieving freedom.

10. Independence

Leaders of India manoeuvred the ship of national liberty to the shore and unfurled the flag of free India on the 15th August, 1947.

With the ushering of the dawn of independence some provinces of British India moved away and organized a new State of ***Pakistan.***

This division of the country also caused Indian Armed forces to split up into two forces—one for India and the other for Pakistan. The problem of splitting the Indian Army was a very delicate problem, because Indian Army was not a mere collection of people in uniform with rifles in hand. Indian Army is, as ever, a living entity with one heart, one soul and one brain, formed by thousands of human being, collected from different clans and zones. Indian Army is the greatest example of *unity in diversity.* During this transition many officers and men who fought shoulder to shoulder shortly before, had to agree pathetically to leave their old associates and units. At the time of partition of the country, the armed forces were distributed to India and Pakistan in the following proportions :

		INDIA	PAKISTAN
1.	INFANTRY REGIMENTS	15	8
2.	ARMOURED CORPS	12	6
3.	ARTILLERY REGIMENTS	18.5	8.5
4.	FIGHTER SQUARDRONS (AIR)	7	2
5.	NAVY		
	(*a*) SLOOPS	4	2
	(*b*) MINE SWEEPERS	12	4
	(*c*) CORVETTES	1	0

Once *Mahatma Gandhi* said, 'Defence, its Army, is to nation the very essence of its existence.' The spirit was loyally carried on by the able followers of Gandhiji and the armed forces of India were christened as *Defence forces.* The very name is itself quite expressive of the national desire. Since independence another important change has been made by renaming Viceroy's Commissioned Officers as *Junior Commissioned Officers* (J.C.O.). Some other fundamental changes were also made, *viz.* (*i*) the three services *i.e.* Army, Navy and Air force, were placed under their own Commanders-in-Chief. Lately the designation of Commander-in-Chief has been changed to (*a*) Chief of Army, (*b*) Chief of Navy, and (*c*) Chief of Air Force. (*ii*) The recruitment in the Armed Forces was opened to all Indians, irrespective of caste or religion. The recruits join the Regiments according to the zone they come from. (*iii*) The separate existence of State Forces were abolished and they were absorbed in the Indian Army.

The government of free India is trying to equip our forces to be sufficiently strong to defend the borders of our country.

11. Republic of India

In 1950, India has been declared as a *Republic.* This political change in the history of the nation has also led to some major changes in the *Defence services* of India. The changes has been summarized below. (1) The prefixes '*Royal*' and '*His Majesty*' have been dropped from the name of units. (2) The '*Kings colours*' of all units were deposited in the *National Defence Academy* (the present *Military College*), Dehra Dun, with due ceremony and new colours were presented to the units. (3) Changes were made in the designs of crests, flags and badges ; the main feature of which was replacement of the *British Crown* by *the three Lions of Ashoke pillar.* (4) Previously the precedence between the three service were followed in India was similar to that of U.K. ; but now it has been changed according to the seniority in origin in India *i.e.* Army, Navy and Air Force. This change was given effect from 1 Feb, 1950.

12. Role of Indian Army

The importance and significance of Indian Army have changed sufficiently since independence.

Just after independence suddenly a heavy responsibility came on the Indian Army of protecting Kashmir from hands of barborous and ruthless raiders inspired and backed by Pakistan. Indian soldiers accepted the challenge with due determination. Seven hundred sorties where flown within three weeks' time and 'they have their M.T. going into the country where one would have said as fantastic before'. The activities of Indian Army and Air Forces amazed the great exponents of Military studies.

It is not only an important organization to maintain the internal security and to protect the industries of the country, but it is also very important and efficient machinery in rendering help to the victims of natural calamities like floods, earthquakes, etc.

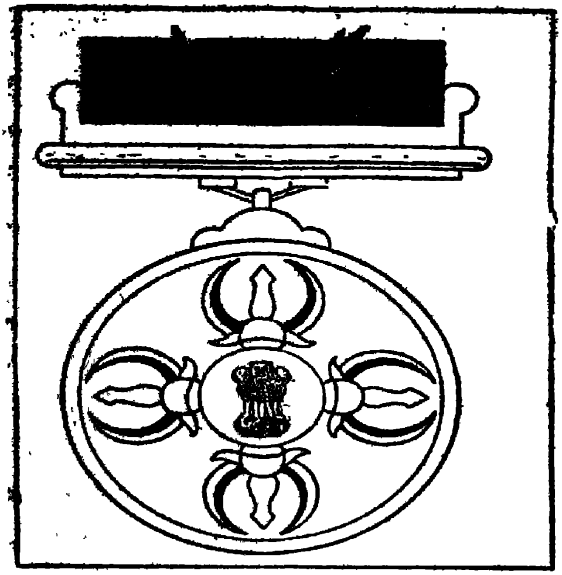
Indian Armed Forces have also worked sufficiently in nation building activities by making roads, bridges even in very difficult areas. They have also helped the government by building houses and accommodations in record time.

The fighting people of India have also earned amazing distinction in establishing peace in a War-threatened world by these few years since independence. *Shri V. K. Krishna Menon*, once minister of defence, proudly described, "No achievement of Our Armed Forces is greater than the unique functions which fell upon our officers and men in the Defence of Peace in Korea, Indo-China and now in Gaza. They are, perhaps, less colourful, but their performance has proved that they can not merely fight but also have the courage and patience to maintain peace which is entrusted to them in difficult circumstances."

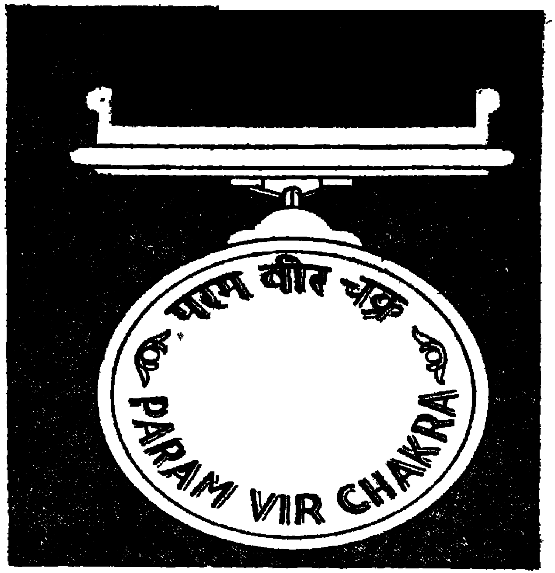
Recently the Indian jawans (soldiers) have once again proved their spirit and quality as fighting people against the trecherous attack of Chinese. They have defended gallantly against the 'human seas' floated by the Chinese at most difficult terrains like Dhola, Tang, SeLa, Walong and Ladakh, situated at very high altitudes of 14,000 ft. and above, under most adverse conditions and supply.

To achieve this standard of efficiency is not an easy job. To be a good soldier one must be a good citizen, an able leader and an efficient instructor. These virtues can only be acquired through arduous hard training.

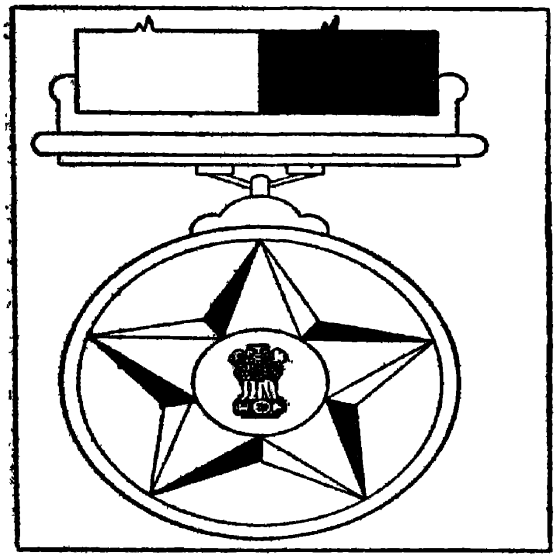
INDIAN DECORATIONS FOR VALOUR AND MERITORIOUS SERVICES
Fig. 2 : A. Param Vir Chakra (P. V. C.), obverse ; B. Param Vir Chakra, reverse. C. Maha Vir Chakra (M. V. C.), obverse ; D. Maha Vir Chakra, reverse. E. Vir Chakra (Vr. C.), obverse ; F. Vir Chakra, reverse.



A


परम वीर चक्र
PARAM VIR CHAKRA

B



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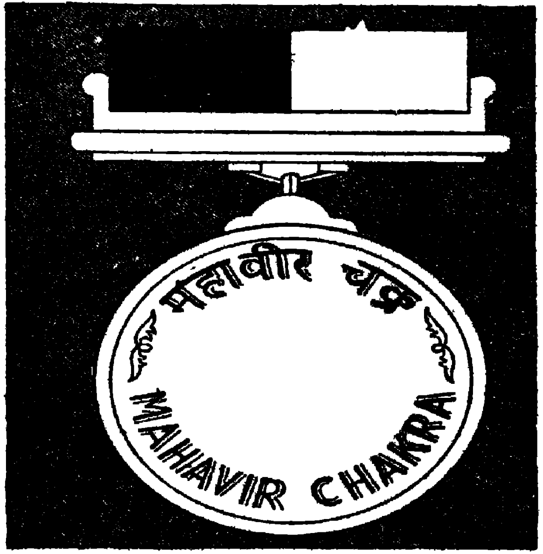
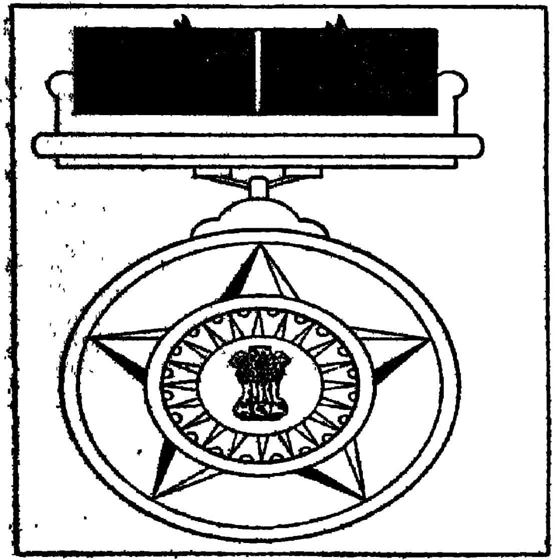

महावीर चक्र
MAHAVIR CHAKRA

D



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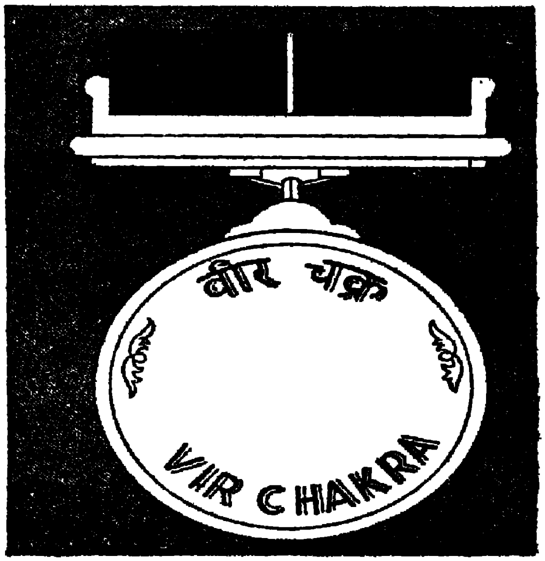
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F

2

THE SECOND LINE OF DEFENCE

1. Introduction

India at present cannot afford to maintain as large standing forces as India really requires, because this will put a heavy pressure on the delicate revenue of the country. At the same time the problem of self defence, particularly when India has got very big frontiers in all sides cannot be ignored. To reduce the burden on taxation for defence purposes the country has organized various defence organizations from the people of other professions. These defence organizations are regarded as the second line of defence. Of the different organizations of second line of defence mentions must be made of (1) *Territorial Army*—which is the second line to the Regular Army, (2) *Auxiliary Air Force*—the second line for Indian Air force. Besides this Auxiliary Air Force the *Civil Aviation* and *Flying clubs* are also regarded as organizations for second line Air power. (3) *Merchant Navy* is considered to be second line of Naval defence. The *National Cadet Corps* is also an organization for defence training for the student communities of the country.

THE TERRITORIAL ARMY (T.A.)

2. Origin

The origin of the *Indian Territorial Force* dates back to 1920, when the *India Territorial Force Act* was passed. The *Indian Territorial Force* was organized in the pattern of Britain's *Territorial Army*, and that consisted of *Provincial Battalions, Urban Battalions* and *University Training Corps Units.*

In 1948 the *Indian Territorial Force Bill* was aborgated and the *Territorial Army* Bill was passed.

In October, 1949, the *Territorial Army* was inaugurated throughout the Indian Union by the then Governor-General of India, *Shri C. Rajagopalachari.*

The Territorial Army stands between a professional army with traditions, conservatism and exclusiveness and civilian population primarily interested in many other ways of life. This army gives chance to all patriotic defence-conscious able bodied Indians to serve the nation's defence programme usually without interrupting their normal civil duties. People join Territorial Army purely on account of their sense of duty towards the safety and security of the country and so command respect from others.

The Territorial Army started functioning under *Brigadier Gurdial Singh*, who was appointed its first director. The progress of T.A. was not satisfactory at the beginning, but scince 1953 things and events in respect to T.A. began to cheer up. By the end of 1954 the strength of T.A. was estimated to be 95 per cent of the then expected target. During the Chinese invasion most of the T.A. units were called for the defence of the country and all of them have proved their worth for the purpose.

3. Objects

Though the general object of T.A. is to form a second line to the Regular Army during national emergency, it has got other specific responsibilities, *viz.* (*a*) it would be responsible for the *antiaircraft* and *coastal defence* of the country ; (2) would supply technical units to assist the Regular Army during war. Of course, one point must be clearly borne in mind that usually T.A. units are not required to perform military duty beyond the limits of India.

4. Organization

By this time the T.A. has developed well and almost every aspect of regular Army soldiering has its counterpart in the T.A. The T.A. has two types of units—*Urban* and *Provincial*. Recruitment to Urban units are confined to the place where the units are located, but recruitment to the Provincial units can be done from the entire zone where the unit is located.

5. Training

Training in the T.A. consists of (*a*) *Recruit Training and*

Annual Training, and (*b*) *Voluntary Training on courses of instructions and attachment to Regular Army units.*

The personnel of Provincial units are to undergo 30 days' training, while the men of Urban units do training for 32 days during the whole year on specified days in every week.

Persons, who have completed the specified Recruit Training, are eligible to undergo Annual Training in camp. The tenure of Annual Training for Provincial units is two calender months, but for the Urban units minimum of 30 days upto a maximum of 60 days of training per year to be completed in the evenings or at weekends.

Voluntary training on courses of instructions and attachment to Regular Army units are meant for officers. Officers of the T.A. are to remain on probation for three years and by that time they are to pass the prescribed retention examination for confirmation.

6. Establishment

The establishment of the T.A. units is similar to the peace time establishment of the Regular Army. The different T.A. units are assigned to various Regular Army units, and the administration of the T.A. units are governed by the Regimental orders of those Regular Army units.

7. LOK SAHAYAK SENA

According to the recommendations of the *Central Advisory Committee of the Territorial Army* an experimental measure to impart military training to a large number of people was started in 1953. This newly trained force was called the *National Volunteer Force.* The scheme proved popular and the committee felt that the period of training should be extended from seven days to a month. Being inspired by the success of the scheme a bill to this effect was moved by the Government and passed by the Union Parliament in August, 1956. Later on a Government ammendment accepted by the Parliament changed the name of the force from '*National Volunteer Force*' to '*Lok Sahayak Sena*.'

The main object of this force is not to produce soldiers but to inculcate a sense of discipline and a feeling of self-reliance in the people at large through the military training.

THE NATIONAL CADET CORPS (NCC)

8. Introduction

The strength of a nation lies more in the quality of its people than in its material resources, and the youth community is the cream of the society. To impart some amount of Military training to the University students of British India an organization, the *University Officers Training Corps* (UOTC) was established under the *Indian Territorial Force.*

But the scope of UOTC was very much limited. So a committee headed by *Pandit Hridaya Nath Kunzru* was formed to study the problem of training the entire students community. This committee after making a detailed study submitted its report in March, 1947. The government of free India decided to implement the recommendations of the *Kunzru Committee* and The *National Cadet Corps Act* was passed by the Parliament superceding the UOTC in 1948. This act empowered the government to raise a corps, named, *The National Cadet Corps,* from the students and teachers of the schools and colleges of the country. An important aspect of this Corps is that the membership of this organization is entirely voluntary for the teachers and the members have got no service liability.

9. Aims

This organization has got three aims, namely the following :

(*i*) To develop character, comradeship, the ideal of service and capacity of leadership in young men and women of India.

(*ii*) To provide service training to young men and women so as to stimulate interest in the defence of the country.

(*iii*) To build up a reserve of man power to enable the Armed forces to expand rapidly in a national emergency.

10. Motto

The motto of this organization is 'Ekata aur Anushashan,' *i.e.* unity and discipline.

11. Divisions of the Corps

The Corps consists of three major parts—The *Senior Division*—recruitment to this division is done from the male students of the colleges and universities ; (*ii*) The *Junior Division*—cadets are recruited to this division from the male students of the schools ; (*iii*) *The Girls Division*—girl students of schools and colleges are recruited to this division and this division is divided into two parts—(*a*) *junior division*, for the students of schools, and (*b*) *senior division*, for the students of colleges.

This corps has all arms and services of Army, Navy and Air force. Thus the structure of this corps is more complete and complex than the T.A.

12. Organizaison

The Corps is directly under the Ministry of Defence, Govt. of India, and is commanded by a Director (now Director-General). The first Director of this Corps was *Col. Bewoor*, and the present Director-General is *Maj. Gen. Virendra Singh.*

To begin with the entire country was divided into 14 circles, according to the states of the country, for all purposes of organization of NCC. As the number of states has increased the total of number of circles also have increased accordingly. All these circles are under direct control of the Directorate, situated at Delhi and the circles are commanded by *Circle commanders.* Circle commanders exercise command over all types of NCC units located in their circles and also deals with the state governments concerned for any local matter.

Formerly all NCC units were commanded by officers of Regular Army posted to NCC.

Recently after Chinese attacks on Indian frontiers the importance of this Corps has been felt by all people of the country, and it has been decided by the Government of India to make the NCC training compulsory for all the students of the country by phases. In accordance with this decision the Corps is expanding very rapidly, and consequently some changes have been affected in organizational set up of the Corps. All the Circle Head Quarters have been elevated to Directorate while the Directorate at Delhi is now the Directorate of the Director-General ; and it is expected that some of the NCC units are being commanded by the NCC officers, appointed on whole time basis. Usually NCC officers, drawn from the teaching staff of schools and colleges who take up the burden of extra responsibility of imparting NCC training to the students, in addition to their normal teaching job.

In addition to these directorates (formerly circles) there are three institutions—(1) Officers' Training School at Kamptee (near Nagpur), and (2) NCC Academy at Purandhar (near Poona), and (3) NCC College for women at Gowalior under the direct control of the Director-General.

13. Training

The training in the NCC is comprehensive and interesting. The basic training of the Regular Defence Services (Army, Navy and Air Force) are imparted to the students. The students who join the NCC are called *Cadets.* The cadets receive training throughout the nine months of their educational year and they get intensive training at camps which are held during the vacations of the schools and colleges. To foster the spirit of adventure among the cadets, they are put out of the camp area, at least for 48 hours, during which period, they trek through routes unknown to them and they establish temporary night-resting place, and cook their own food. To inculcate the spirit of social service and value of manual labour, the NCC cadets are required to do some amount of social work during their camps and a special camp, the *Social service camp*, is organized every year for some selected cadets.

Cadets, who show special aptitude are trained in *advance leadership* in some specially organized camps ; and those cadets who are interested in mountaineering can join *Himalayan Mountaineering Institute* at Darjeeling. Besides this, recently an intensive course on Rock climbing has also been introduced in the advance leadership training camps.

Officers, selected from the schools and colleges are required to undergo a *Pre-commission Training* at any of the previously mentioned institutions for commission. After successful completion of this training they are granted commission by the Government of India and are posted to various units.

To keep the officers informed with the latest development they are sent to *Refresher Training Courses* from time to time. Recently, Government of India is considering a plan to attach some of the selected NCC Officers and cadets to Regular army units for a period of 4 weeks.

14. Role of the NCC

The Corps has played a vital role to improve the qualities of the students and to make them better citizens. The efficiency of the cades have been steadily recognized by Armed Forces of India and a good number of seats at Military College, Dehra Dun, have been reserved for the cadets of NCC.

15. AUXILIARY CADET CORPS (ACC)

As the NCC is rather expensive, another corps called *Auxiliary Cadet Corps* has also been organized with 'Service to the country' as its motto. This corps is under the control of the Director General of the NCC.

3

CITIZENSHIP

1. Introduction

The study of citizenship primarily concerns the rights and duties of a man as a citizen. Originally a man who lived in a city was described as a citizen. The Greek philosopher *Aristotle* defined the citizen as 'a person who took an active part in the political and judicial functions of the city state'. The concept of the citizen has changed greatly with the widening of the state with its vast size of population. A citizen is now 'a member of a political community, who owes allegiance to the state and who enjoys protection and the rights granted by the state'. Though enjoyment of political rights is one of the most important criteria for becoming a citizen, a citizen has also certain important and essential duties towards his state.

2. Types of Citizenship

But not all people living in a state are entitled to these rights and duties. In a state generally three categories of people live. they are : (A) Citizens, (B) Partial Citizens, and (C) Aliens. A *citizen* is one who owes allegiance to the state and who enjoys both political and civil rights. A *partial citizen* is one who also owes allegiance to the state but does not enjoy all the political rights, as for example, a prisoner. An *alien* is one who owes neither allegiance to the state, nor does he enjoy any political right ; but he enjoys only the civil rights.

3. Acquisition of Citizenship

There are two types of citizenship and the same can be acquired (A) *by birth*, and (B) *by naturalization.*

A. CITIZENSHIP BY BIRTH : It may be acquired in two ways, *i.e.*, (*i*) *Jus Sanguinis* and (*ii*) *Jus Soli* or *Julo Luci*. According to *Jus Sanguinis*, child acquires automatically the citizenship of his father wherever he might be born. France follows this principle. According to *Jus Soli*, a child may acquire the citizenship of the land where he is born. This is the American principle to acquire the citizenship. England, however, follows both these principles.

B. CITIZENSHIP BY NATURALIZATION : It means the adoption of an alien as citizen of the state when the former has fulfiled certain conditions. These conditions may be residence or appointment in the service of the state for a number of years or purchase of land or marriage of a citizen in that state, etc.

4. Loss of Citizenship

Citizenship can be lost in serveral ways. The main thing is that a man cannot be a citizen of more than one state at the same time. As soon as he acquires the citizenship of another state, he loses the same of his own state. Thus citizenship is lost by a woman marrying a foreigner, acceptance of service under foreign state, absence from one's own state for a considerably long time, etc.

5. Rights of a Citizen

Rights are, in the words of *Prof. Ihering*, 'legally protected interest'. A citizen of a modern state enjoys a variety of rights.

Classification of Rights

Every citizen enjoys certain rights granted and upheld by the state to which he belongs. These rights which empower a citizen to do or enjoy something without the intervention of others and which is the duty of the state to protect and enforce are called '*legal rights*' and are distinguished from the '*Moral rights*, on the ground that the latters are based on ethical principles. Moral rights are upheld by the moral opinions of the society and not by the state itself. Legal rights may again be classified into (A) *civil rights*, and (B) *political rights*. Civil rights are those which are essential for a civilized and decent life and for the uplifting of man's mental faculties while political rights refer to a citizen's active participation in the governmental affairs of the country.

A. Civil Rights

(1) **Right to life :** There cannot be any civilized life without the state assurance that the life of a citizen will be protected from the attack of other—both from within and outside the society. This also implies that a person is entitled to attack and even kill others to save one's ownself from their attack.

(2) **Right to liberty :** Mere right to life cannot ensure a decent living unless the state guarantees that a citizen will not be restricted in his movement within the state or by anybody, that he is not wrongfully arrested or detained without a fair trial. This freedom of movement is, however, not unqualified, *e.g.*, in case of war, restrictions are imposed on his movement for the interest of the state.

(3) **Right to property :** This right relates to the freedom of a person to obtain and enjoy his own property. This means that no other person, nor even the state itself except in case of emergency, is allowed to interfere with this enjoyment of property.

(4) **Right to contract :** A citizen in a modern state also enjoys the liberty to make contract with others—subject to the condition that such contracts do not go against the public benefit and the interest of the contracting partners.

(5) **Right to religion and conscience :** This right enables the citizen to follow any religion he likes and to perform his religious duties without wounding the sentiment of others. This implies that no person can be forced to accept any particular religion or to pay subscription for religious purposes.

(6) **Right to culture and language :** As in the case of religion a modern citizen also enjoys the freedom to preserve and develop his own culture and language. Such a right inevitably protects the cultural interests of the minorities in a state and indicates that they have every right to develop their own culture.

(7) **Right to equality before law :** This is of particular importance in a democratic state, for it implies that the law of

the country treats alike all the persons—rich or poor, literate or illiterate.

(8) Right to freedom of thought and expression : This right can be divided into (*a*) *Freedom of speech* and (*b*) *Freedom of papers.* By freedom of speech is meant an individual's right to express his opinion in public and as well to criticize the policies and activities of the government without the interference by anybody. The freedom of the press empowers the citizen to publish his opinion in books or newspaper. Both the freedom of speech and the freedom of press are not absolute, bearing in mind the interest and benefit of the society.

(9) Right to public meeting : A citizen has the right to form association and hold meetings to carry out his ideas and to express his views. But government of any country always reserves the right to prohibit any violent association or meeting.

(10) Right to education and work : A good citizen must be properly educated and hence he has the right to enjoy the facilities offered by the state to educate himself. He has also the right to get suitable job from the state with a living wage and reasonable leisure.

B. Political Rights

(1) Right to vote : This is an important right which a citizen exercises in order to choose his own government.

(2) Right to hold public offices : By this right a citizen is eligible to hold any of the public offices.

(3) Right to petition : A citizen has the right to make petition to the government or to the legislature for redress of his grievances.

6. Fundamental Rights of an Indian citizen

We have so long discussed the rights of citizen in general. Let us now see how far these rights are enjoyed by an Indian citizen. Until 15th August, 1947, India was under the alien rule and hence the Indians did not enjoy all the rights of a citizen of a sovereign country. India has now become a sovereign state and now the Indians have regained their civil rights. The constitution of India grants the following fundamental rights for her people : Right to (*i*) *freedom of speech*, (*ii*) *free association*, (*iii*) *free assembly*, (*iv*) *free press, subject, of course, to the provisions of the law*, (*v*) *equality before law, irrespective of race, community or sex* (*vi*) *the use of all public places, wells, tanks, temples, etc.*, (*vii*) *full religious freedom*, (*viii*) *there will be no untouchability in India*, and (*ix*) *every person above the age of* 18 *will have the right to vote.*

7. Duites of a citizen

As a citizen enjoys certain rights, he has also certain duties or obligations to the state which he has to perform consciously. Some of the civic duties are based on ethical sense and others are obligatory by law. The following are the normal duties of a citizen :

(*a*) **Allegiance** : This is the most important and primary duty of a citizen which alone distinguishes him from an alien. This duty can be discharged by him by joining the armed forces when needed to protect the state. He should also support the public officers and help the police in the discharge of their duties.

(*b*) **Obedience to law** : Laws are enacted to promote the common interest and benefit of the society. Thus obedience to law is an important duty of a citizen so that the government can function properly. In order to become a good citizen a person should not only obey laws of the country himself, he should again see that others also do the same.

(*c*) **Payment of taxes** : Government of a country have been entrusted with certain job for the common benefit of the society which the former cannot do unless provided with sufficient fund. The same is realized by the government from the citizens by means of taxations which the latter must pay as a matter of obligation towards the state.

(*d*) **Other duties** : Besides the above-mentioned duties, a citizen should (*i*) be honest in exercing his adult franchise, (*ii*) be ready to hold any public office when called upon to do so, and (*iii*) one must not be guided solely by private self-interst only.

A citizen must always remember that whatever one does that will affect one's own state and society in some way or other. So, before comitting any work or ommitting any duty one must judge the pros and cons of that from the society's point of view. A nation is regarded by others not for the gospels the leaders preach but for the activities of individuals—isolated or in a group. The thoughts of a citizen should be guided by the idea that one must pay back the state and society for the advantages and comforts they have given to the citizen.

4

LEADERSHIP

1. Introduction

Leadership is the capacity of leading a group of men to achieve an aim through all types of situations and circumstances. This quality is highly essential for all commanders of armed forces, because commanders actually control the battles and war.

Some people are born with this capacity, but any average intelligent person can develop this trait of character by endeavour and training.

2. Aim of a Leader

To earn the confidence of his followers and also of others.

. Ingredients

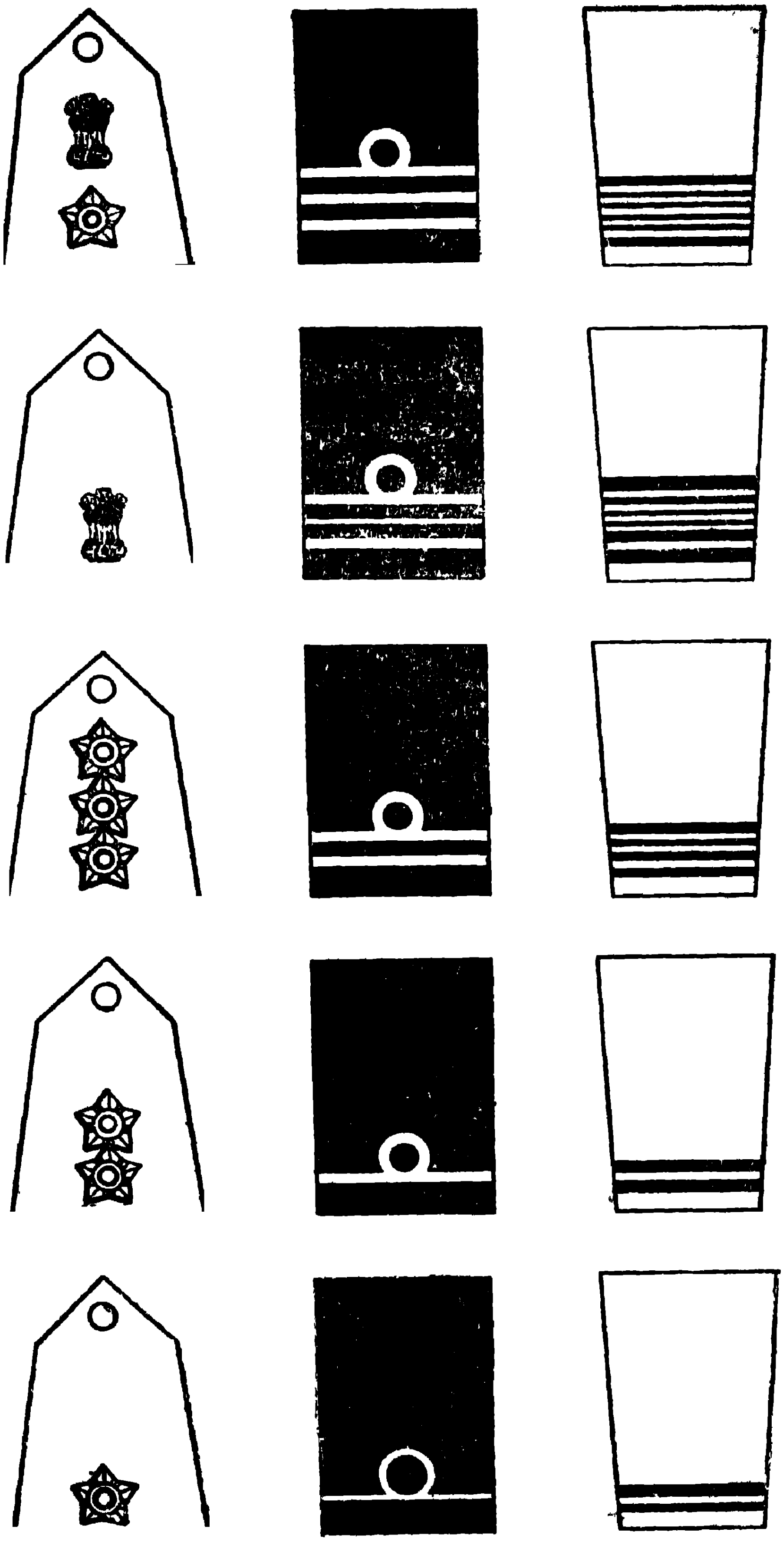
The ingredients of good leadership are as follows :

(*a*) *Bearing and Personality*—Bearing depends upon physical appearance, dress and manners ; personality however is a comprehensive term and it depends on the integrity of character. *Dr. Link* has explained, "Personality is the extent to which the individual can convert his abilities and energies into habits and actions which successfully influence other people."

(*b*) *Fairmindedness*—It indicates treatment to juniors should be based on justice. A leader must ensure that the distribution of responsibility and work is done fairly.

(*c*) *Sympathy*—This is a mental attitude which enables one to understand the difficulties and troubles of juniors. A leader must always encourage his juniors to bring forward the legitimate complaints.

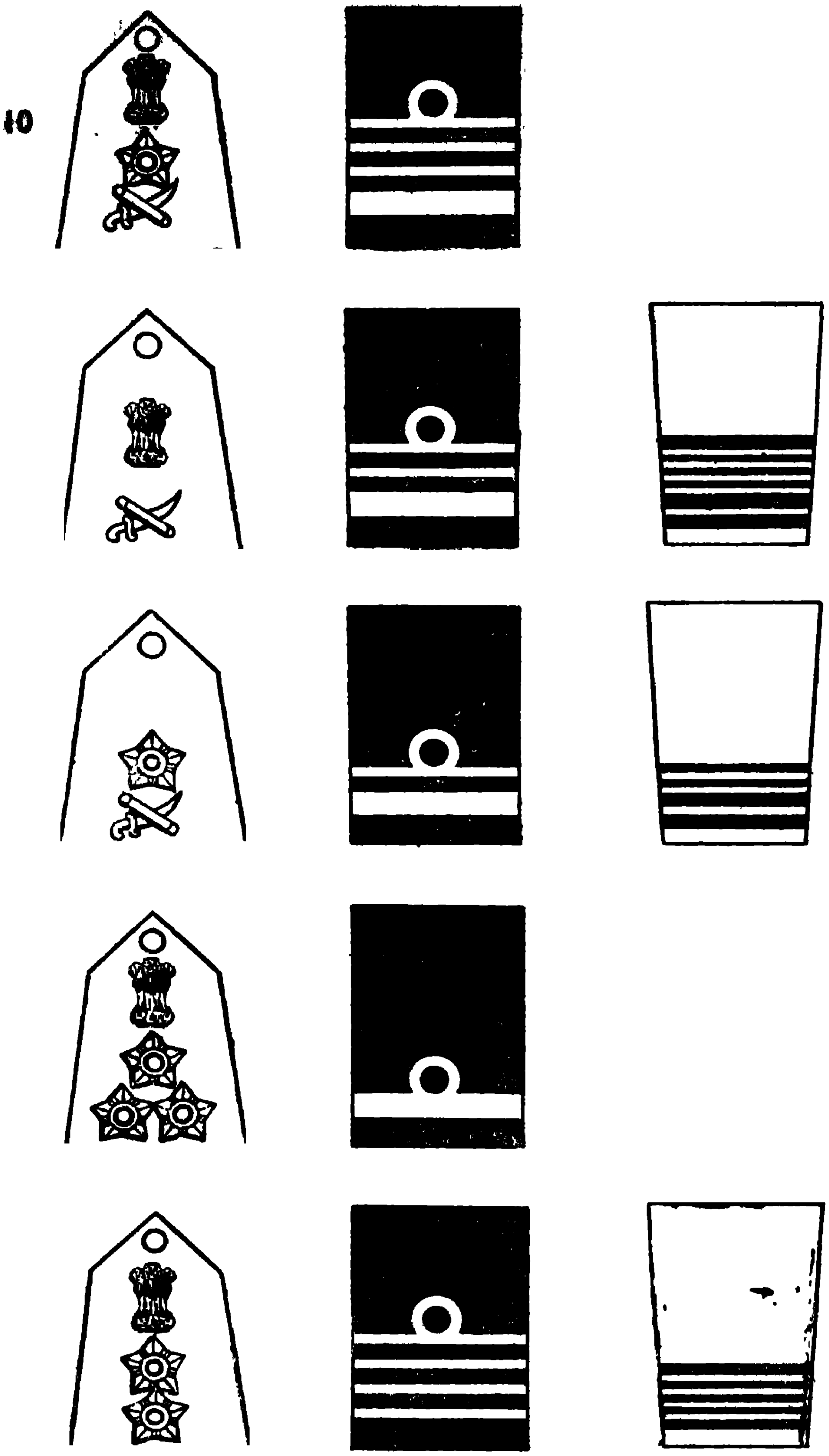
(*d*) *Serving attitude*—The attitude of the leader is always to serve the others and not to rule. The interests of the



EPAULET BADGES OF OFFICERS OF INDIAN ARMED FORCES (I)

Fig. 3 :

	A—Army	B—Navy	C—Air Force
1.	Second Lieutenant	Commissioned Officer	Pilot Officer
2.	Lieutenant	Sub-Lieutenant	Flying Officer
3.	Captain	Lieutenant	Flying Lieutenant
4.	Major	Lieutenant-Commander	Squardron Leader
5.	Lieutenant-Colonel	Commander	Wing Commander



EPAULET BADGES OF OFFICERS OF INDIAN ARMED FORCES (II)

Fig. 4 : A—Army	B—Navy		C—Air Force
6. Colonel	Captain	..	Group Captain
7. Brigadier	Commodore 2nd class	..	Air Commodore
8. Major General	Rear Admiral and Commodore 1st class		Air Vice Marshal
9. Lieutenant General	Vice-Admiral		Air Marshal
10. General	Admiral		Air Chief Marshal

leader must NOT be focussed on himself but on his subordinates. This quality enables the leader to see things from the juniors' point of view and makes him selfless.

(*e*) *Professional knowledge*—Clear and thorough knowledge of professional works and duties are highly essential.

(*f*) *Robustness*—This means the ability to stand shocks, a high margin of mental strength over the average breaking strain. This is essential for the leaders who lead troops to actual fighting.

8. Qualities of a Leader

(*a*) *Loyalty*—Enthusiastical faithfulness.

A leader must have loyalty to country, constitution, constitutional head and also to the regiment.

Loyalty to duty sometimes may confront one to some unpleasant situation, but a loyal one will still stick to the duty.

Loyalty to comrades makes one agreeable to share their hardships and dangers and to place their interest before one's own.

A good leader is equally loyal to his seniors and also to his juniors. Loyalty to superiors means proper execution of the orders and desires of them must be carried to the word in proper spirit. A loyal leader considers the desire of a senior is more than an order. Loyalty to superior does not prohibit the leader to advise the superior. Loyalty to the juniors demand the proper and efficient management of them. This also makes obligatory on the part of the leader to put forward the troubles and difficulties of his followers to the proper authority.

A loyal leader remembers that the honour and safety of his country come first and for all times, the honour and safety of his juniors come next, and his personal honour, safety and comfort come last.

Loyalty gains confidence of others.

(*b*) *Self-confidence*--Reliance on one's ownself.

Self-confidence gains confidence and respect of others. Self-confidence can only be obtained by thorough study and practice. A leader must be able to show the way to his followers with precision.

Remember, *both excess or less-confidence is injurious.*

(*c*) *Self-control*—The capacity of keeping one's own excitements and emotions within one's ownself.

Self-control enables one to remain cool-headed in an emergency and to show disregard to danger, thus setting an example which will inspire the subordinates.

To illucidate the need of this quality it has been said that, 'Men who can control themselves and their own apetites can control circumstance and other men'.

The importance of self-control has been explained by *Senera* as 'Most powerful is he who has himself in his powers'.

(*d*) *Exemplary behaviour*—A leader must always remember that his behaviours, on duty or off duty, should be example to his juniors. Juniors always watch the leaders. *A leader must remember, behaviour commands respect.*

(*e*) *Enthusiasm*—It means the zeal and the interest in the task. A leader must always enthuse his subordinates by his manners and dealings. Regarding the importance of enthusiasm *Butler* has said that, 'It is the man whose enthusiasm lasts for thirty years who becomes a leader'. *Enthusiam is the sure road to efficiency.*

(*f*) *Cheerfulness*—The capacity of keeping one in pleasant spirits and hopeful.

A leader must, at all times and in all circumstances—no matter however grim it is, remain cheerful. Specially when situation goes towards worse due to some inevitable or unavoidable reason, a leader must remain cheerful, so that he can stimulate his subordinates. To remain cheerful the leader should have the sense of *humour i.e.*

the capacity to appreciate and enjoy the many amusing events of every day life. Humour produces balanced optimism and boosts up the drowning morale of the people. *Apropriate humour and lifely appreciation keeps up morale.*

(g) *Thoroughness*—It involves attention to details in the care of subordinates, to bring forward legitimate complaints to him ; and, if required, the leader should also take up the case to his seniors.

A leader must know in detail the temperament and psychology of his subordinates, so that he can assess and appreciate their efficiencies. *Mutual understanding brings solidarity.* A good leader always protects his subordinates from the blastings of higher authorities. Remember, *protection begets confidence.*

(h) *Foresight and planning*—The capacity of leading people depends mainly on foresight and correct planning. If a leader can foresee and prepare correct plans, his subordinates will never be in troubles. This improves the *administrative ability* of the leader. The leader who is not good is administrative aspect fails soon.

(i) *Resolution*—Firm determination to carry on and complete the task, whatever it may be.

This is a spirit which never allows slackness. The importance of this quality has aptly been described by *Folwell Buxton.* According to him, 'the great difference between men, the feeble and the powerful, the great and the insignificant, is energy and invincible determination—a purpose once fixed and then death or victory'.

A leader must have the power of taking quick decision, this is more required when the situation is more adverse complicated, and unnerving. This is very difficult though, yet for leaders who guide men to fight, is essential. Regarding this quality *Francis de Guingand* has said, 'Firm decisions at critical moments are like gusts of fresh air in the fog of war'.

(j) *Initiative*—It enables one to do something with one's own resposibility without waiting for orders from higher authority at times of necessity, through improvisation and adaptibility.

This helps the leader in solving most of the unforeseen troubles. Initiative depends mainly on the fore-thought of the leader.

(k) ***Professional knowledge***—The leader must know more about the job than his juniors.

This requires constant touch with latest books, pamphlets, and manuals. ***A leader must read and do things by himself.***

To summarise all the ingredents and qualities of a leader ***Field Marshal Sir William Slim*** has precisely said, "Leadership is a mixture of example, persuation and compulsion.........It is the projection of your own personality so that you get men to do what you want them to do even if they are not very keen on doing in themselves."

5

INSTRUCTORSHIP

1. Introduction

Instructorship is the capacity of imparting any lesson to students in such a way that the students understand it clearly and get a lasting interest in the subject. *Instructors are not born but are made by constant effort and practice.*

2. Aim of an Instructor

To enthuse the students to know more of the subject.

3. Ingredients

The ingredients of good instructorship depend on the following :

(*a*) *Thorough knowledge* : This can be acquired only by reading up-to-date pamphlets, manuals, etc.

(*b*) *Capacity of explaning clearly* : It depends on clear and methodical thinking before teaching.

(*c*) *Sympathy for the pupils* : It should be concealed in mind and must never be allowed any external expression. Students must not be indulged to take advantage of it

(*d*) *Patience* : This is of paramount importance in teaching.

4 General notes for Instructors

(*a*) An instructor must remember that example is better than precept. His bearing, enthusiasm, cheerfulness, ability of work and smartness of turn out and appearance should be an inspiration to his students.

(*b*) An instructor must remember that his duty is to teach and not to make his students afraid of him. To achieve this he must be sympathetic, tactful, humorous, hard-working and patient.

(*c*) The voice of instructor is one of the chief factors in teaching. A pleasant voice itself is a charm and inspiration for the students. It does not mean that the voice should always be very loud, but the instructor should remember that his voice should be so loud that each student of the class can hear without strain.

(*d*) If the instructor likes to demonstrate something, he should arrange the class in such a way that each student of the class can see that easily. The demonstration must be short and concise and should make all the important points obvious to the class.

(*e*) Any explanation must be brief, clear, specifi to point, and simple.

(*f*) Success in teaching depends on the planning of the exercise and arrangement of the class. *A good instructor works more before and after the class than in the class.* He always remembers that he gets a small span of time for actual teaching, so not a second of that should be wasted.

5. **Do's and Don'ts for Instructors**

(*a*) Teach only ONE thing at a time. Before the class starts check up that all stores required for the lesson are ready.

(*b*) Prepare yourself thoroughly well before you go to teach.

(*c*) Make the lectures as simple as possible, demonstrations accurate and examples clear.

(*d*) Make your expressions clear, lucid, confident and unambiguous.

(*e*) Be natural when you teach and when your students ask questions. Speak slowly, distinctly and accurately.

(*f*) Be extremely sympathetic to willing but deficient students. Encourage them.

(*g*) Praise everybody for a little success.

(*h*) Mistakes must be corrected immediately without fail. Remember that the '*Jane' do*' mentality is not beneficial for the student nor for the teacher, but seriously ruinous for all (*i*) Must know every student by name.

(*j*) If you are to ask any question, first throw the question to the whole class, allow some time to think out the answer, then point out somebody by calling his name

(*k*) Be insistent on discipline and manners in the class

(*l*) The slightest fault due to neglect or sign of laziness must be dealt with severely and immediately.

(*m*) Encourage your students to put questions during question hour.

(*n*) Avoid mannerism and gestures.

(*o*) Do not show favouritism.

(*p*) Avoid anything in the nature of sarcasm or bullying at the cost of anyone. Remember, very few can forgive this.

(*q*) Do not narrate anything in the nature of story of something which directly or indirectly tells praise of your ownself. *A boastful teacher is never regarded by students but is hated.*

(*r*) Do not *bluff*. It is better to admit ignorance then to bluff.

(*s*) Do not keep your class in one way for a long time. Try to put some sort of action or change over after every point of discussion.

(*t*) Do not ask *more than one* question at a time.

6. General Principles of Good Instruction

It is very difficult to lay out some rigid principles of good instruction, as it involves *human* factor. Every individual student is a problem for a good instructor and should be tackled accordingly. So a good instructor cannot be stereotyped in his approach. Every moment he must take into consideration the reaction of his students and according to that the instructor shall have to decide his plan for further progress. The undermentioned points must only be regarded as *guides and not rules,*

The principles are :

(A) *Keeping the aim clearly in view.*

Every one likes to know why one is working or learning. To explain the importance of this fact *Nansen* has said, 'It is the struggle toward a goal that makes a man happy.'

For all lessons there are two types of aim —(i) the ultimate aim, i.e. the long-term view, and (*ii*) the immediate aim.

(*i*) The ultimate aim : why the whole course or syllabus is meant for ; as for example, to train a cadet to be a good citizen as well as a potential officer for the defence forces of the country.

(*ii*) The immediate aim : the aim of the period *i.e.*, the lesson for the period.

Remember, *aim must always be unambiguous, plain and simple.*

(B) *Planning and preparation.*

Planning of training is very important. One must remember that 'nothing excels the education one picks up systematically for oneself.'

The instructor must plan how to impart the lesson. He should think, what are the stores required ? How the class is to be arranged ? In which group of instruction the lesson comes (see appendix A) ? What sense of the students is to be exercised (see appendix B) ? Is the instructor well prepared ? Has the instructor gone through the latest note on this lesson ?

Remember, *'the more thorough the planning is, the deeper the instruction penetrates'*.

(C) *Simplicity.*

Method of teaching should be as simple as possible. A good instructor never poses nor makes the impression that he is teaching a very difficult subject. If any complicated lesson is to be taught, break the lesson in parts. Teach part by part, so that each part appears to be a simple lesson.

(D) *Human factor.*

Of all factors the most important one is the human factor.

A good instructor always takes care to see that the students of his class are at maximum comfort and in proper spirit. He should consider the following points :

(*i*) *Convenient time and place of work* : Some types of lessons *i.e.*, practical works which involve physical exercises, should be always done in early hours of the day and should be avoided after heavy meals ; while some other types *e.g.*, theoretical works should be done under shade.

(*ii*) *Accommodation* : Students of the class should be accommodated properly, so that no student is to take strain to see the instructor or to listen to him.

(*iii*) *Light* : Classes should be taken under proper light arrangement. Light should not fall directly on the eyes of the students. If situation requires, the instructor should face the light but students should NEVER.

(*iv*) *Distraction* : Instructor must see that attention of students cannot be disturbed by any other object or factor.

(*v*) *Breaktimes* : A long-drawn class is of no help to the students, so after a suitable length of time a rest period, at least of five minutes, must be given. Break times are not wastage but these small leisures refresh the brain and energy. Rest means re-vitalization.

(E) *Interest.*

Instructor must see that the interest of the students is living at all times. Interest promotes activity. To maintain interest one instructor should be careful on the following points :

(*i*) Realistic approach in the training ;
(*ii*) Variety of presentation ;
(*iii*) Competitive sentiment among individual students ;
(*iv*) Sense of achievement by the class. This point is most important. If the students realize that they have learnt something new that does not only make them happy to go forward but also gives the confidence required.

(F) *Maximum activity.*

An instructor must extract the maximum possible advantage from the limited available scope and time. To achieve this, students must be constantly kept on work—mental or physical, as the case may be.

Mental activity is usually obtained by (*i*) Questions, (*ii*) Problems, (*iii*) Quizes, (*iv*) Reasoning, and (*v*) Discussions.

(G) *Determination of the value of training.*

If lessons taught by an instructor is not thoroughly understood by each individual student, the teaching becomes useless. So to determine whether the training is going through the students, it must be checked at each stage. Instructor should NOT proceed on with the lessons without checking the class thoroughly.

Checking can be done by (*i*) Questions, (*ii*) Problems, and (*iii*) Making the students 'working' in case of practical lessons.

(H) *Correction of faults.*

An instructor must expect faults or improper works by his students. Faults and bad works must be corrected promptly and sympathetically. After correction, faults must not be permitted to reappear. An instructor must look out for faults—minor and major. Minor faults also should be treated as equally important as major ones.

To correct one individual student an instructor should mention the good points of the student first and then only he should speak of the bad points. The job of checking of faults may be unpopular one, yet this must receive the prime attention of the instructor. An instructor should ensure that the student gets the impression that the fault was committed due to lack of adequate knowledge or skill and the student has NOT done it intentionally. But if the instructor realizes that it was committed intentionally by the student then the student must be dealt with severely.

An instructor must remember that positive verbal correction (*e.g.*, "look straight") is more powerful than negative correction (*e.g.*, "don't look down"). While correcting faults do not specify the student at the first instance, the instuctor should just mention the correcting measures to be adopted. As for example, in one class one boy is looking to the sky and not paying attention to the class. The instructor should just casually mention that there is nothing in the sky which deserves attention of any student. The defaulter student may correct himself by that polite caution. If the student doesn't, after being politely ticked off twice or thrice, then only call out the name of the student. Remember, every student is equally sensitive as the instructor is, so it is not fair to wound anybody's feelings at the first occasion but at the same time it is useless to go on shouting 'don't do this,' or 'do this', as perhaps in a class of twelve only one or two persons require correction. Therefore, if the correcting measure is repeated in general terms more than two/three times, in all probability nobody will take notice of the command.

An instructor must always remember that he himself did not attain his standard by one day.

Appendix A

Most of the lessons can broadly be grouped into any of the following :

1. *Knowledge* : The lessons which are to be imparted through the medium of lecture and also through demonstration.
2. *Skill* : The lessons which involve practical execution of something or actual handling and working with instruments, weapons and other such articles. It includes P.T., drill, and W.T.
3. *Technique* : The instructions which depend both on knowledge and skill. It includes practical lessons of map reading, fieldcraft, and tactics.

Appendix B

The senses by which a man learns are—*hearing*, *seeing* and *actual doing.* To learn something a man uses either any of these three or by a combination of them. An instructor must try to make the students use as many of the senses as possible, with due emphasis on the suitable ones. Usually the senses are utilized as follows :

1. *Knowledge* : Hearing supplemented by seeing.
2. *Skill* : Actual doing.
3. *Technique* : A combination of all the three senses.

Sequence of teaching different types of lessons

To get the best result from the students, lessons must be imparted in a scientific sequence. The sequence varies according to type of lessons. Generally the sequence of teaching for all lessons of one type remains the same. In the following paragraphs these sequences have been enlisted.

A. Sequence for Physical Training (P.T.)

Any lesson of P.T. consists of 5 parts, and for each part there are definite exercises. Before starting the class the instructor must calculate how much time he can give to one particular lesson.

Part 1. *Mobility* : This part is intended to make all the limbs of the body mobile, this can be achieved by exercises in the following sequence :

(*a*) Game-form running activity,
(*b*) Exercise of Arm and shoulder,
(*c*) „ „ Trunk,
(*d*) „ „ Leg,
(*e*) „ „ Arm and shoulder,
(*f*) „ „ Trunk, and
(*g*) „ „ Leg.

(*h*) *Breathing* : After the exrcises of part 1 all students must be given at least 5 minutes' time to breathe freely ; students will breathe normally in their own times inhaling long breaths.

Part 2. *Strengthening* : This part is intended to increase the strength of all the limbs of the body ; this is achieved by the exercises of the following types :

(*a*) Game-form strengthening activities.
(*b*) Exercises of the trunk—lateral, abdominal and dorsal.
(*c*) Pulling, Pushing, Lifting and Carrying (only ONE exercise for one lesson).

Part 3. *Group activities* : This part is intended to promote team spirit in the stundents through hard physical work ; this can be achieved by the following types of exercises :

(*a*) Jumping, Vaulting and Skipping.
(*b*) Rolling.
(*c*) Climbing.
(*d*) Balancing.
(*e*) Competitive team games.

Part 4. *Endurance* : This part is intended to increase the enduring capacity of the individuals ; this can be done by the following types of exercise :

(*a*) Walking and running.

Part 5. *Carriage* : This part is intended to train every individual the method of carrying different limbs of the body in relation to the differnt movements ; this can be done by the following exercises :

(*a*) Reformation of class in three ranks.

(*b*) Position of attention, stand at ease, marching with special attention to correct technique.

N. B. (1) There are different tables of P.T. ; an instructor before going to take class must consult the tables and proceed gradually from table No. 1 to onwards.

(2) During P.T. class students are given rest only for breathing otherwise they are to be constantly kept at work.

(3) After the P.T. class an instructor *must* ask every individual whether anybody is hurt or wounded, whether anybody has lost anything during the class and will act accordingly.

B. Sequence for Squad Drill (S.D.)

Each lesson of squad drill consists of 5 parts and in each part there are gradual steps to proceed.

Part 1. *Forming up and Inspection* : In this part the instructor forms up the squad for the class.

(*a*) The squad will be formed either in a semicircle or in a line facing the instructor.

(*b*) The instructor will carry out a very quick but accurate inspection of the turn out of the cadets.

(*c*) If the instructor is new for the squad (*i.e.* if he does not know the names of all cadets), he should also do the numbering. A class is always numberd from the right.

Part 2. *Explanation* : In this part the instructor tells and explains what he is going to teach in that period.

(*a*) The instructor tells in a very simple language what he is out to teach.

(*b*) In suitable cases he also explains the necessity and importance of the work.

Part 3. *Demonstration* : In this part the instructor demonstrates the movement himself for clear concept of the cadets. This part is usually intermingled with the Part 4 *i.e.* the Execution.

(*a*) The instructor tells what is the word of command for this movement.

(*b*) He shouts the word of command and gives a complete demonstration of the movement. He does it twice at least.

(*c*) Next, the instructor gives the demonstration by parts telling that he is demonstrating by numbers.

(*d*) Once again he demonstrates the first phase of movement and also explains that phase of the movement, showing the points clearly to all the cadets.

(*e*) Thus the instructor will proceed phase by phase.

Part 4. *Execution* : In this part the instructor will get the work done by the squad. The instructor corrects the faults of the cadets. This is also done by phases. As the instructor completes explanation and demonstration of the first phase, he will set the squad to practise that part. Once again the instructor will demonstrate the next phase of the movement and the squad will be set to do that. The instructor will proceed on in this way :

(*a*) The squad exercises the work by numbers ;

(*b*) The squad exercises the full movement with the time being shouted ;

(*c*) The squad is divided in pairs ; and each pair works on its own time ;

(*d*) Once again the squad is formed and they carry on the whole exercise all together judging the time in their minds.

Part 5. *Repetition* : In this part the squad is set to do the whole exercise continuously and repeatedly so long they do not attain the desired standard of accuracy and speed.

C. Sequence for Arms Drill (A.D.)

The sequence of lessons of Arms Drill is almost similar to that of S.D.

Part 1. *Forming up and inspection* : Exactly similar to that of S.D. but the following point is to be done in addition :

(*a*) The instructor must inspect the arms of every cadet and also get his arms inspected by the No. 1 cadet at the start of the class.

Part 2. *Explanation.*
Part 3. *Demonstration.*
Part 4. *Execution.*
Part 5. *Repetition.*
Exactly similar with S.D.

D. Sequence for Weapon Training (W.T.)

All lessons of weapon traning consists of eight parts mainly.

Part 1. *Forming up and inspection* : In this part the instructor forms up the squad with the weapons and persons.

(*a*) The squad will be formed up in line on the right side of the weapon at least at a distance of 3 yards.

(*b*) Cadets must always be at some distance behind the muzzle of the weapon.

(*c*) If the squad is big, the squad may be divided in three ranks—the first rank being in the sitting position, the middle rank in kneeling position and the rear rank in standing position.

Part 2. *Revision* : In this part the instructor will refresh the memory of the cadets of the squad on the just immediate relevant lesson.

This can be done by any of the following ways :

(*a*) By putting questions ;

(*b*) By asking the cadets to do some work of the relevant previous lesson.

Part 3. *Aim* : In this part the instructor will tell in clear language the aim of the lesson which he is going to teach in that particular period.

Part 4. *Stores and arrangement* : Though before the start of the class the instructor must keep all the necessary stores arranged properly in the required places, still he must tell what are the articles required for that lesson and where they are to be kept.

Part 5. *Approach* : In this part the instructor must thoroughly explain the necessity and importance of the lesson.

Part 6. *Explanation and demonstration* : In this part the instructor will first tell, in how many parts he is going to teach the lesson. Then he will tell the first part only. He will explain the part, demonstrate the work and in necessary cases will also get work done by the cadets. Completing the first part of the lesson the instructor will proceed on to the next phase and so on.

Part 7. *Execution and repetition* : In this part the instructor will set the whole squad to do the total work continuously and repeatedly so long the cadets do not attain the desired standard of accuracy and speed.

Part 8. *Clarification* : In this part the instructor will invite questions from the squad on the lesson, so that he can remove any grain of doubt or haziness from the mind of the cadets. Instructor must not show any sign of tiredness or boredom at this phase. He must explain the matter until all the students of his class are completely satisfied.

The Key word 'PROSAIC' may enable the instructor to remember the sequence of weapon training lessons, where

'P' stands for—*Preliminaries*, which includes Forming up and Inspection ;
'R' stands for—*Revision* ;
'O' stands for—*Object* i.e. aim of the period ;
'S' stands for—*Stores and arrangement* ;
'A' stands for—*Approach* to the lesson ;
'I' stands for—*Instruction*, which includes Explanation and demonstration also Execution and repetition part ;
'C' stands for—*Clarification*.

6

DRILL

1. Introduction

It is an exercise of armed forces wherein a group of people are put to work under the direct command of one commander.

2. The Object of Drill

The object of drill can be describe as follows :

(*a*) To instil a team spirit in every individual, making it clear that NO individual is important and NO one is dispensible. Drill makes a man understand that each individual is an important part of a machine contributing a definite force to drive the machine to success.

(*b*) To build up the foundation of discipline. Drill makes everyone to carry out immediately and implicitly any order given by the commander. By continuous practice this trait of character gets impregnated in every individual, and thus everyone becomes fit to carry out the orders of one's commander with full determination even in the noise and fog of war.

Regarding these aspects of drill *Brig. G.I.S. Kuller* has said, 'Drill is a form of mass discipline. The man ceases to look upon himself as an individual but as one of a body of men.........Years, or even months of it, produce what is wanted in battle—a man who thinks in terms of the battalion and not of self and in whom obedience and discipline are so inculcated that he automatically does what he is ordered to do.'

(*c*) To make everyone mentally and physically alert. By continuous practice of drill one gets quick control of muscles and the power to make neat and speedy movements ; and also quick decisions.

(*d*) Efficient drill makes oneself proud of one's own unit. Though to start with everyone feels that drill is useless sweating, boring and to some extent punishment, but when at the end, one drills smartly in an efficient squad gets enormous satisfaction and pride.

3. Perfection of Drill

It must always be borne in mind that no one can be perfect in drill over-night. To be really perfect in drill it requires constant and continuous practice. At the same time drill has got an advantage that at every drill period it is possible to aim at a definite standard of perfection.

Perfection of drill is mainly the responsibility of the commander. He must have a very keen eye to find out the faults of the squad and must instantaneously check the point. Every instructor must start the execution phase of the work after proper demonstration and explanation. So to correct the faults he may, at the initial stage, simply shout the fault and say to correct that. But if it does not help, he should halt the squad, and once again show the correct way of work and then make the squad work once again. On any account the drill commander must not allow any one of the squad to perform a movement half-heartedly or sloppily. It is a sacred duty of the drill commander to become hard task-master, even if he is to become ruthless at times.

4. Drill Instructor

In the foregoing paras it has been stated clearly that the perfection of drill is the responsibility of the drill instructor. In the subsequent paras a few more points are being stated regarding the drill instructor. He must have smart bearing and turn out. The standard of his turn out must always be much above than that of his squad. He must also ensure by daily inspection that each one of his squad is in good turn out every day.

He must have a strong but pleasing personality to infuse into his squad the determination to do all the movements precisely.

He must earn an awe-struck respect for himself from his squad but must never be impatient for popularity. An instructor must always remember that it is not popularity but respect which is required most. Respect can be earned only by personal example, exhibited by work and NOT by word.

He must know how to give correct command on drill. Movements of drill depends absolutely on the commands. Commands must be loud, clear, distinct and sharp, so that as soon as the commander gives the command the squad will move without a pause for a single second. To achieve this quality the instructor must practise every day at his own time. It is the tone of voice which commands respect and obedience.

He must know how and when to encourage the squad. In this connection it may be said that the drill of squad will be good when the squad has been sufficiently warmed up and excited. It is the temper of the squad which brings sharpness in the movement. At the same time the instructor must always remember that NO BODY likes to be scolded in presence of others, so whenever an outsider is present the instructor must appreciate the squad.

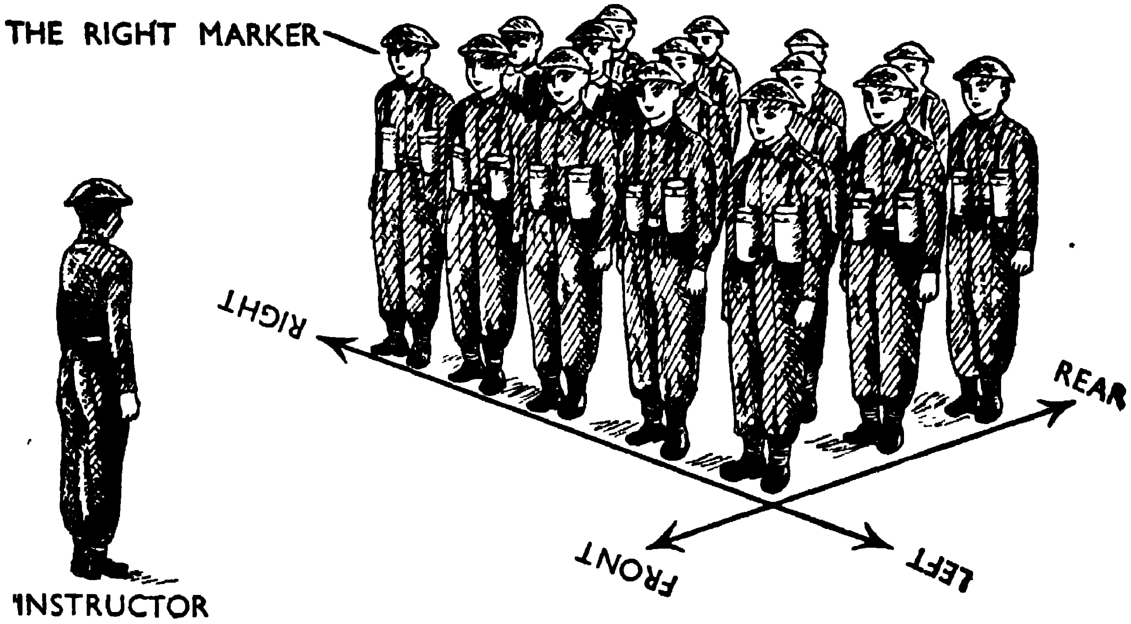
When the instructor makes the squad moving he must NOT move with the squad but turn to the direction required remaining stationary in his own point. The instructor must always control the squad by his voice. The instructor must always give the commands at least from a distance of 15—20 yards.

In making the squad working the instructor himself must stand at attention position. All the commands are always given from attention position. It is desirable that for the whole time of work the instructor should stand in attention position.

The instructor must always make himself expressionless. Slightest touch of his mind should not come out through any of his expressions. He must also inculcate this character in every individual of his squad.

5. Acid test

Whether the squad has got through properly, can be tested by the following points. The drill must become a part of the military make up, *i.e.*, in all movements, on parade or off parade. Everyone individually or collectively performs the drill movements, exhibits shining smartness, alertness. Everyone salutes the officers and comes to attention automatically when speaking to or being spoken to by a senior.



FORMATION OF A DRILL CLASS

Fig. 5 : In a drill class the Instructor must always remember the position of the right marker, and the frontage and other sides—right, left, rear of the class.

6. A few guiding points for the instructor

(*a*) When taking charge of a squad, watch carefully the right-hand man of the front rank ; and then only you will be able to keep the frontage and other directions of the squad even after a series of movements.

(*b*) Use your command voice judiciously divided into two parts—(*i*) cautionary, and (*ii*) executive. Cautionary part will be loud, clear and slow with adequate pauses in between the phrases. Remember, that this part of command is intended to make the squad aware and alert for the next movement. Executive part must be given very sharply and more loudly than ever. Remember, that whole work of the squad depends on this part of the command. It must pass through the squad as an electric spark.

Specimen :—"Tin-o-tin dahine chalega (slowly, clearly) (pause) squad (louder) (pause)—Dahine (louder and enlengthened) (pause)—mur (loudest, sharp)."

(*c*) The executive part of command must be given on the correct foot. In this connection it may be said, on the quick march, all commands excepting 'Dahine mur, Dahine Ghum, Adha dahine and Tham' will be given as left foot passes the right, and the above-mentioned commands will be given as the right foot passes the left one. But on the slow march everything will be just on the reverse way.

7. A few points on the common movements

(*i*) *Savdhan* (Attention) : (*a*) Body erect, perfectly still but NOT stiff, (*b*) head up, (*c*) eyes looking straight at the front at one's own height and still, (*d*) chin vertical and in, (*e*) neck straight and filling the collar, (*f*) the shoulder square and forced downwards, (*g*) chest up, (*h*) hands fixed with body behind the seam of the trousers, elbow straight, fingers making loose half fist and the thumb towards the front, (*i*) weight of the body on both the legs, knee stright, (*j*) heels together making an angle of 30° at the front.

(*ii*) *Vishram* (Stand at ease) : Exactly like Savdhan with following differences—(*a*) left foot pushed towards left, and the distance between the heels is 12 inches, (*b*) hands towards back, the right hand in palm of the left, fingers straight and thumbs crossed.

(*iii*) *Aramse* (Stand easy) : Exactly like Vishram but the upper part of the body can be relaxed, but no further movement nor talking is allowed.

(*iv*) *Dahine mur* (Right turn) : (*a*) Pivot on the right heel and left toe (weight on the right heel), (*b*) move to the right keeping hands fixed with the body, (*c*) pull the left foot from the ground by 6 inches, (*d*) stump the left heel just by the side of the right heel.

(*v*) *Baen mur* (Left turn) : Exactly similar with Dahine mur, but in place of right read left, and in place of left read right.

(*vi*) *Pichhe mur* (About turn) : (*a*) Always turn about by the right side in the manner of 'Dahine mur', (*b*) as the body goes back, lock the left foot with the right one by the knee, give a pause, (*c*) bring the left foot by pulling 6 inches above the ground and stump that hard on the ground.

(*vii*) *Dahine saj* (Right dress) : (*a*) Raise the right arm smartly on one's own shoulder level, making a half fist, (*b*) touch the next man on the right by the knuckles of the right hand, (*c*) as right hand is being raised turn the head smartly to the right simultaneously, (*d*) after a little pause move forward or backward with short but sharp steps to pick up the dressing from the right man. Remember that during 'Dahine saj' the right marker will NOT move, (*e*) centre and rear ranks do not raise arms, but will move as required.

When the squad has taken up proper dressing the instructor gives the command, 'Samne Dekh'. With this command the squad will (*a*) turn heads to the front, (*b*) cut the arms sharply and bring them on the side without making any sound and thus all will come to 'Savdhan' position.

(*viii*) *Savdhan se tejchal* (Marching from attention) : (*a*) Throw out the left foot to full pace of 30 inches, (*b*) at the same time swing the right arm forward, (*c*) arms to be swung from shoulder rythmically, keeping the elbows straight, making the half fist, the thumb being in the front and pressed downwards, the swing of the arms should be such that the fists come upto the belt both in front at the rear.

All other positions of 'Savdhan' must be maintained.

(*ix*) *Tham* (Halt) : (*a*) The left foot completes the pace, (*b*) the right foot is brought smartly and stumped by the side of the left foot, (*c*) stand perfectly still of the position of 'Savdhan'.

(*x*) *Line ban* (Fall in) : (*a*) Everyone comes by double, forms line on the left side of the 'Dahina Darshak', (*b*) every one takes the pace automatically by themselves ; (*c*) looks front, and (*d*) takes up 'Savdhan' position.

(*xi*) *Line tor* (Fall out) : (*a*) Take one step forward or backward (if standing in the front rank or rear rank), (*b*) take up the 'Savdhan' position, (*c*) salute and move forward.

(*xii*) *Khule line chal* (Open order march) : (*a*) Step off with left foot, (*b*) take two sharp steps to the front (if standing in the front rank) or to the rear (if standing in the rear rank), the middle rank does not move, (*c*) arms will remain still by the sides, (*d*) dressing should be taken automatically.

(*xiii*) *Nikat line chal* (Close order march) : (*a*) Take two brisk steps just in the direction opposite to that of 'Khule line', (*b*) step off with left foot.

(*xiv*) *Swasthan* (Break off) : (*a*) Turn sharply to the right, (*b*) salute smartly, (*c*) break the line.

(*xv*) *Siloot* (Salute) : (*a*) Bring the right hand by smart circular motion keeping all the fingers clenched together and the palm completely open, fingers, wrist and elbow in a straight line, (*b*) the tip of the forefinger will remain near the centre of the right eyebrow, (*c*) keep the hand in that position for the definite pause, (*d*) cut down the hand smartly by the shortest route and take up the 'Savdhan' position.

(*xvi*) *Dahine/Baen Siloot* (Right/Left salute) : (*a*) Command comes as the left foot passes the right, (*b*) one step of right foot is allowed to go for pause, (*c*) as the left foot touches the ground for the next step the head turns to the direction (right/left) and the hand also comes up simultaneously, (*d*) the hand is cut down to 'Savdhan' position as the left foot comes on the ground after completing six steps, (*e*) throughout the movement the left hand will remain still by the side of the body.

(*xvii*) *Dahine/Baen Dekh* (Eyes right/left) : The same movements as those of para (*xvi*) barring the movements of the right hand ; and according to the direction of the movement the right/left guide will NOT move his head.

(*xviii*) *Tin-o-tin Dahine/Baen ghoom* (Wheeling in threes to the right/left) : (*a*) The inside files take short steps (21 inches), the middle files take usual steps, the outside files take long steps (33 inches) and all of them move round in the new direction at the same time, keeping the dressing undisturbed, (*b*) all the files wheel on the same spot as the leading file.

(*xix*) *On the march 'Pichhe Mur'* (About turn) : (*a*) Turning is completed by three steps starting with the left foot ; feet should be raised 6 inches above the ground, (*b*) after completing the turn, take a full step with the right foot and swing the arm properly.

(*xx*) *Kadam Tal* (Mark time) : (*a*) The command completes as the left foot touches the ground, (*b*) allow one step of the right foot to go as a pause, and (*c*) instead of taking further step forward raise the left foot high so that the thigh bone becomes parallel to the ground and the leg remains at right angles with thigh, and the toe pointing towards the ground.

8. A few very common terms

(1) *Parade Commander* : The officer or the instructor who actually commands the troops on parade.

(2) *Marker (Darshak)* : Peoples employed to mark areas on which to direct a movement or by which formations or alignments of troops regulated.

(3) *Right marker (Dahina Darshak)* : The man who stands at the rightmost position of the body of troops at the front line.

(4) *Rank :* A line of men standing side by side in a straight line.

(5) *File :* A line of man standing one behind the other covering the front man.

(6) *Flank* : The sides of the body of men.

(7) *Covering* : It is the act of placing one man directly behind the other to conceal the former one from the front view.

(8) *Dressing* : It is the act of placing a group of men in a straight line side by side, so that, if viewed from any side only one man will be visible.

(9) *Front* : The direction to which troops face or move at the very beginning of the parade or work.

(10) *Frontage* : The area of the ground covered laterally by the first line of the body of troops.

(11) *Depth :* The area occupied by a body of men from front to the rear.

(12) *Interval :* The lateral distance between bodies of troops on the same alignment, measured between adjacent flanks.

(13) *Alignment :* The straight line on which a body of troops form up.

(14) *Order* : The normal distance between the front, middle and the rear ranks.

(15) *Open order :* An increased order for ceremonial or inspection purposes, usually in this order the distance from the middle rank to either of the front or rear rank becomes 75″ inches *i.e.* the distance between the front rank and the rear rank becomes 150″ inches.

(16) *Close order :* The distance between the ranks reduced to suit the requirements. Usually the distance between the ranks in this order is 30″ inches.

(17) *Column* : It consists of bodies of troops, on parallel and successive alignments. The distance between the front ranks of each successive bodies is equivalent to their respective frontages.

(18) *Close column :* A column where the distance is reduced to unit requirements, usually the distance between the front ranks of two successive bodies of troops will be 9 paces.

(19) *Open column* : Here the pace between the troops constituting the column is increased according to the requirement.

(20) *Distance* : The space between the units constituting the column.

(21) *Pace* : This is a measurement of distance on foot. It also means the rate of movement.

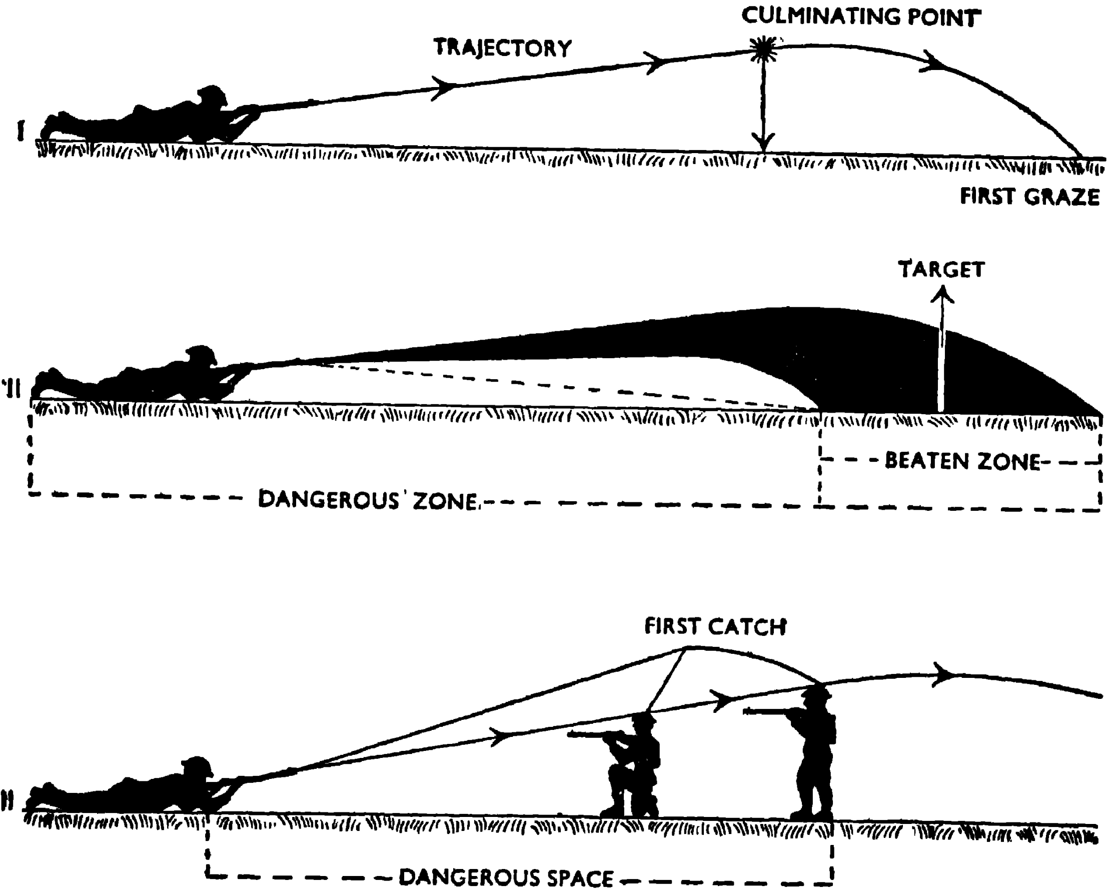
7

THEORY OF SMALL ARMS FIRE

As the tactical use of the weapons depends mainly on the characteristics of the same, a knowledge of the elementary theory is essential for an officer, J.C.O. and also for a N.C.O. Before discussing the theory a few words should be defined.

1. *The axis of the barrel :* It is an imaginary line drawn from the centre of the breech head to the centre of the muzzle.

2. *The line of sight :* It is the straight line from firer's eye to

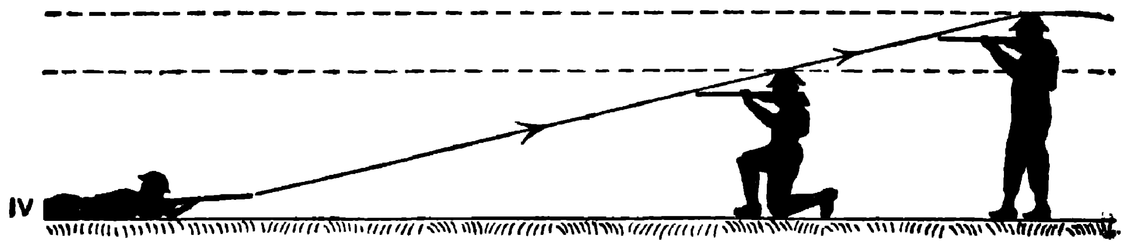


DEFINITIONS

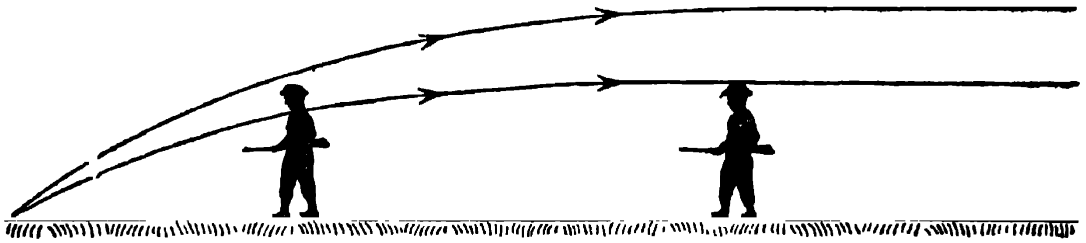
Fig. 6 : Every firer must know : I. What is the path traversed by a bullet after being fired, the maximum height it may reach and the point on the ground where it actually hits ; II. The area of the ground which may be covered by bullets and the area which may be dangerous for the enemy ; III. The point of the target where the bullet hits first, its relation to the height of the target.

the point of aim passing through the backsight 'U' and tip of the foresight.

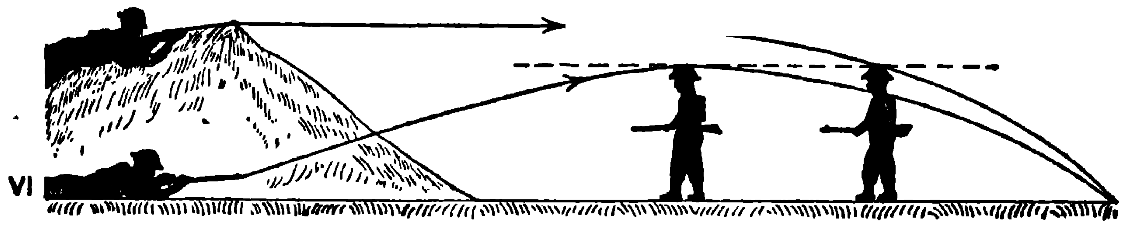
3. *The line of departure :* The direction taken by the bullet as soon as it leaves the muzzle. Though one might consider it to



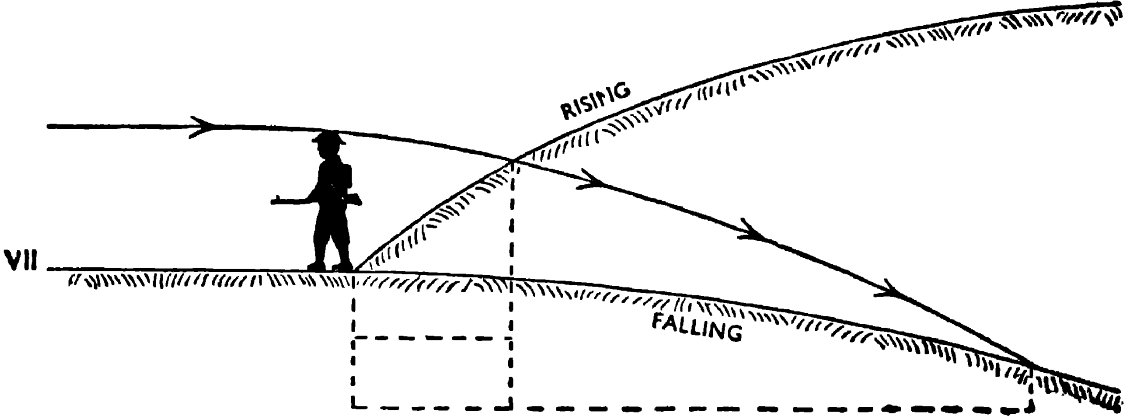
THE EFFECT OF HEIGHT OF TARGET ON DANGEROUS SPACE



THE EFFECT OF THE FLATNESS OF THE TRAJECTORY



THE EFFECT OF HIGH GROUND DANGEROUS SPACE



THE EFFECT OF THE SLOPE ON THE DANGEROUS SPACE

FACTORS AFFECTING THE DANGEROUS SPACE

Fig. 7 : The extent of the dangerous space is not constant but it depends on certain factors : IV. the bigger the target in height the greater is the dangerous space ; V. the dangerous space varies directly with the flatness of the trajectory ; VI. the higher is the ground of the firer the lesser is the dangerous space ; VII. the closer the similarity of the ground to the trajectory the greater is the dangerous space.

be the prolongation of the axis of the barrel, practically it is not so. Usually the rifle jumps little, whenever it is fired, and thus the line of departure moves away from the line of the axis of the barrel.

4. *Jump* : The difference between the axis of the barrel and the line of departure expressed in terms of angles.

5. *The line of fire :* The direction of the target from the muzzle of the weapon.

6. *Trajectory* : The path actually traversed by the bullet after being fired. Remember, the path of a projectile is always a parabola.

7. *Culminating point* : The highest point the bullet rises above the line of sight on its trajectory. This point usually, happens to occur slightly beyond the midway between the weapon and the target.

8. *First catch* : The point of the target where the bullet first hits it.

9. *First graze* : The point of the ground where the bullet will touch it, if not stopped by any obstacle on its way.

10. *Dangerous space* : This is the space between the first catch and first graze. The area of dangerous space is not constant but depends on certain factors. It decreases when the following conditions occur :

(*a*) The nearer the weapon is to the ground. A downward firing, the *plunging firing*, creates a false trajectory where the dangerous space is minimized. For this reason one should always try to fire from the ground level.

(*b*) The higher target is.

(*c*) The smaller the range is. With the decrease of the range the trajectory becomes flatter and in a flat trajectory the first catch occurs earlier. But if the slope of the ground falls in the same way as that of the trajectory,the dangerous space is increased ; but it does not necessarily mean that if anyone is positioned in the slope of the ground which lies in the opposite direction to the trajectory, that one is immuned; he must also take cover there.

11. *Beaten zone* : The area of the ground covered by bullets.

12. *Dangerous zone* : The area of the ground where the bullets are likely to strike a target. This is also described as the beaten zone plus the dangerous space.

13. *Cone of fire* : The pattern formed by the paths of several bullets fired by one weapon from one point.

14. *Collective fire* : The fire of several weapons fired under the control of one commander.

15. *Group* : The diagram made on the target by a series of shots fired from one point by the same firer with the same weapon. But usually by the word 'Group' is meant the diagram made on a target by 5 consecutive shots fired from one point by the same firer by the same rifle.

16. *Mean point of Impact (MPI)* : The central point of the line joining the two widest shots of the same group.

17. *Direct fire* : When the target is visible from the firer's position, and the sights are laid directly on the target.

18. *Indirect fire* : When the target is not visible from the firer's position and the sights are laid on the target not directly.

19. *Enfilade fire* : The fire which sweeps over certain area or a line.

20. *Flanking fire* : The fire applied from the sides of the troops, whom this intends to give protection.

21. *Overhead fire* : The fire which passes over the heads of own troops.

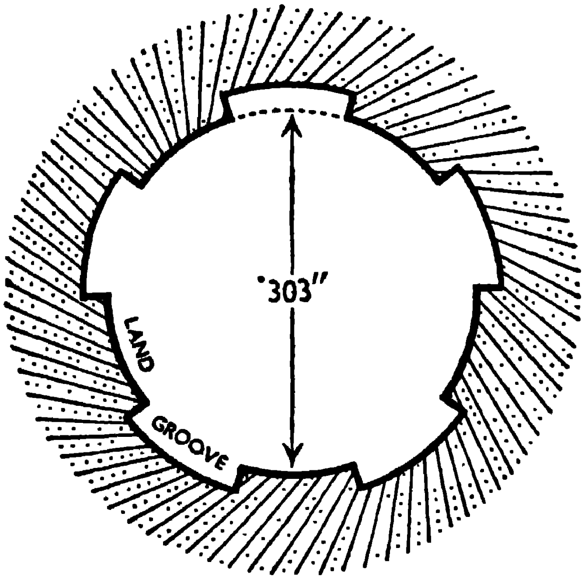
22. *Plunging fire* : This is the type of fire which has got a steep angle of descent.

23. *Fixed line fire* : The fire operated from a weapon, which is so mounted that the weapon can fire on predetermined target or area, regardless of the firer's visibility of the target.

24. *Ricochets* : This is the flight of a bullet after striking a hard obstacle on its way.

Elementary Theory of Rifle Firing

A few forces act behind the departure of a bullet from a rifle and there are some factors which affect these forces. They are as follows :



CROSS SECTION OF A BARREL OF RIFLE
Fig. 8: Rifling of the barrel is a characteristic feature of a rifle. The rifling is left handed and it makes a complete turn in 10″. The depth of grooves varies from ·005″ to ·008″.

1. *Rifling*: By rifling is meant that a barrel has spiral grooves cut down the bore. When the cartridge is fired the bullet is forced into the grooves with a tremendous pressure, consequently the bullet leaves the muzzle in a spinning motion. This ensures steadiness of the flight of the bullet.

2. *Force of explosion* : When the trigger is pressed the firing pin hits at the centre of the base of the cartridge and causes ignition of the bullet. This is associated with the formation of gas. The gas pushes the bullet forward (as there is the only opening available) through the bore to the muzzle into the air.

3. *Movement due to recoil* : But as the bullet leaves the muzzle a vibration is set up in the weapon and it jumps backward. If the holding of the firer is not sufficiently strong, this jump of the weapon not only hits the firer but also the aim is altered.

4. *Oil or grease in the barrel or in the cartridge* : Generally to avoid rusting, the barrel and also the cartridges are kept coated with a thin lining of oil. But before firing, the rifle and the cartridges are usually cleaned. If for some reason some oil or grease persists either in the barrel or on the cartridge, it causes abnormal jump and consequently erratic shooting, because this oil prevents proper friction between the case of the bullet and chamber.

5. *Filling of all parts of rifle* : If any screw of the fore-end or any wraping remains loose, a severe jump will be caused.

6. *Effect of bayonet on firing* : The weight of the bayonet

exerts certain effect on the firing. Every firer must know what is the actual effect of the bayonet.

7. *Resting of the rifle* : A firer must always hold the rifle at the point of centre. If it is not done properly, the accuracy of the firing will be affected.

8. *Resistance of air* : As bullet comes out of the muzzle, air offers resistance on the flight of the bullet. Head or rear wind actually does not necessitate any change of aim, but cross wind or inclined wind always causes the change of aim.

9. *Force of gravity* : This force always pulls the bullet towards the ground. For this reason when the bullet is to be fired at a target on a long distance the angle of barrel in relation to the ground is increased upto 45°. The elevation is done automatically by setting of the sight.

10. *Temperature* : Usually there is no appreciable effect of temperature on firing. When cartridges become heated in the sun, rifles usually shoot high.

Elementary Theory of Bren Gun Firing

Forces acting on the bullet fired by a Bren gun are the same as those acting on the bullet fired by rifle. In addition to those a few more points are to be known regarding Bren gun firing :

1. *Cone of fire* : Bullets being fired from a Bren gun pass through forming a cone of fire, the pattern of which is oval in shape.

2. *Beaten zone* : A beaten zone is formed round the target when automatic fire is correctly applied. The size of the beaten zone varies with the range of the target and slope of the ground.

3. *Dangerous zone* : To make the fire effective the target must be within the limits of the dangerous zone. It must be remembered that as range of the target increases the depth of the beaten zone decreases, due to the higher angles of descent of the bullets.

8

RIFLE

1. Introduction

In spite of the introduction of automatic weapons, the rifle is still the chief weapon of infantry. It is individual soldier's weapon —excepting a few specialized personnel, all soldiers of infantry are equipped with rifle. It is a very reliable and accurate weapon. It is the accuracy of rifle that makes it so important. "It is important, therefore, that the training with the rifle should be thorough, because it is the foundation for the subsequent teaching of other weapons."

There are many types of rifle, but uptill recently the standard service rifle of Indian Army was the Small Magazine Lee-Enfield (SMLE) rifle of ·303 inch bore. This type of rifle is technically known as Rifle No. 1 MK III. After Chinese aggression in 1962, Indian Army is gradually changing over from Rifle No. 1 MK III to Semi-automatic rifle produced by Ordnance factories of India. Besides this type Indian Army also uses Rifle No. 2 MK IV (mainly for training purposes), Rifle No. 4 MK I (T) (for specialized jobs) and Rifle No. 5 (used by Paratroopers). Rifle No. 3 is being used by the Police of India.

These are the rifles which are to be manipulated for every shot. Besides these there are many types of automatic rifles. The semi automatic rifle produced by India can operate burst fires like all other automatic weapons and can also be manipulated for each shot.

2. Description

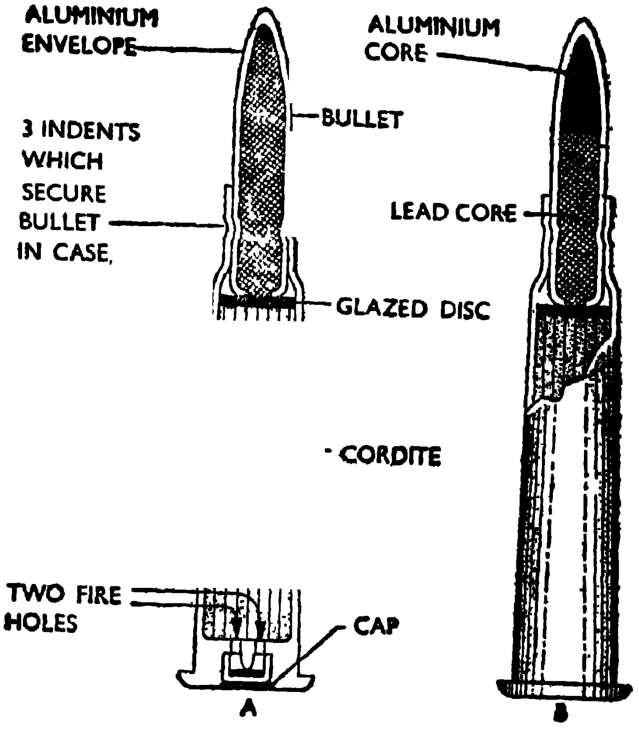
Usually a rifle (Rifle No. 1 MK III) consists nearly of one hundred and thirty separate parts and bear the make numbers on seven different places (1—Boss for Bayonet; 2—Foresight; 3—Upper sling carrier; 4—Tangent leaf sight; 5—Bolt knob lever; 6—Magazine; 7—Butt Plate). Besides these make numbers a number is also painted on the butt by the armoury, by which also a rifle can easily be identified.

The diameter of the barrel of Rifle No. 1 MK III and Rifle No. 4 MK I is ·303 inch, hence commonly these types of rifles are known as ·303 rifle. The barrel of a ·303 rifle consists of five grooves ; each groove is five inches in length. Thus a barrel is twentyfive inches long while the length of a rifle, without bayonet, is fortyfour inches and a half. The barrel can withstand a pressure of twentysix tons to one square inch.

3. Characteristics

A rifle can fire upto 2,000 yards, but this is seldom done. A man can fire with a rifle upto 600 yards with aim, but the battle effective range is regarded upto 300 yards. The sight can be adjusted to the minimum range of distance of 200 yards.

The magazine of a rifle is of box type and can take in ten cartridges at a time, but the magazine of Indian semi-automatic rifle is elongated and can contain many cartridges. A cartridge of a rifle consists of two main parts—brass case of bullet and the propellant charge and the means of ignition in a cap at its base. A bullet being fired leaves the muzzle of rifle with the velocity of 2,440 feet per second and gives a very strong back kick. The trajectory covered by a bullet fired by a rifle is a flat one.



CARTRIDGES

Fig. 12 : As the firing pin hits at the base, ignition is caused in the cartridge forcing the propellant part to leave the brass case empty.

The normal rate of firing of a rifle is 5 aimed shots per minute and the rapid rate of firing is 10 to 15 aimed shots per minute. Experts can fire up to 25 shots per minute. If a rifle is efficiently manipulated, it may produce an effect of machine gun firing.

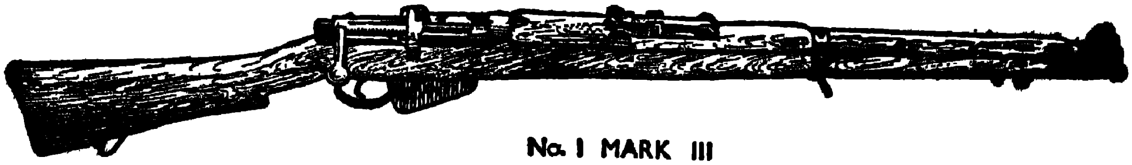
Exploiting the accuracy of rifle, snipers can cause horror evoking results. Remaining motionless for hours, camouflaged in all sorts of strange patterns, they can take steady toll of enemy.

The rifle can be carried and concealed easily. This weapon can withstand considerable rough handling and practically without any stoppages.

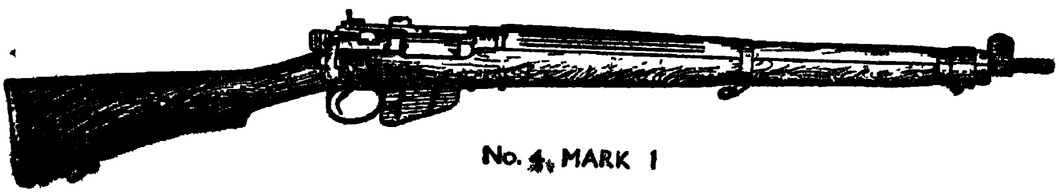
Besides bullets, a rifle can also fire grenades upto 200 yards with the aid of a discharger cup. The rifles which fire grenades (Grenade firing rifle—G. F., Rifle) are equipped to withstand the jerk caused by the departure of the grenade.

The Rifle No. 2 MK IV is commonly called as ·22 rifle as the diameter of its barrel is ·22 inch only. This rifle is mainly used for training purposes as it has a few advantages over ·303 rifle. The main advantages are : (1) it does not give a back kick when fired, so a new firer gets confidence in firing and check his faults, (2) its foresight being very small it helps the firer to train the eyes in aiming more precisely.

At the same time ·22 rifle has got certain limitations too. Limitations are : (1) it is not the soldier's own weapon, (2) sight setting practice cannot be done, (3) reloading practice cannot be done in this rifle, and (4) the real thrill of firing cannot be experienced.



No. 1 MARK III



No. 4, MARK I

Fig. 14 : RIFLES OF TWO TYPES

A comparative account of Rifle No. 1 MK III and Rifle No. 4 MK I is given below :

	CHARACTER	Rifle No. 1 KM III	Rifle No. 4 MK I (T)
	Diameter of the barrel	·303 inch	·303 inch
2.	Weight	(*a*) 8 lb. 10½ oz without bayonet (*b*) 9 lb. 11½ oz with bayonet	(*a*) 8 lb. 13 oz without bayonet (*b*) 9 lb. 4 oz with bayonet and 9 lb. 8 oz with telescope
3.	Length without bayonet	3 ft. 8½″	3 ft. 8½″
4.	Length with bayonet	5 ft. 1¾″	4 ft. 5″
5.	Length of barrel	25″	25″
6.	Battle effective range	300 yards	1,000 yards with telescope
7.	Rates of fire (rounds per minute) (*a*) Normal	5	5
	(*b*) Rapid	10—15	10—15
8.	Magazine capacity	10 rounds	10 rounds
9.	Remarks	Used by all soldiers.	Known as 'sniper rifle' as it is very useful for the snipers. Instead of back sight 'U' there is an aperture hole in it. It can fire the anti-tank grenade M9A1.

MECHANISM OF A RIFLE

Fig. 13 : Top—As the bolt is pulled back one cartridge rises from the magazine at a level parallel with the chamber ; **Centre :** When the bolt is pushed forward the cartridge is forced into the chamber, simultaneously the spring of the bolt becomes compressed and the cocking piece remains held by the sear. **Bottom :** When the trigger is pressed the sear moves and the striker flies forward to explode the cartridge.

9

BAYONET

1. Introduction

Whatever new weapons may come and however effective they may be, the last phase of war must always be fought with bayonet. Bayonet is the simplest weapon but very effective in close quarter battle. In the last war there were occasions where the efficiency of bayonet as an offensive weapon was reported in quite authoritative documents. Its effective use depends upon the morale and fighting determination of the soldiers.

This is very effective for fighting in jungle, villages, streets and also in the elemination of enemy air-borne troops.

Its usefulness for silently killing enemy sentries, patrols, etc., specially in night is of great magnitude.

2. Description

There are mainly three types of bayonets : (1) Spike pattern bayonet, (2) Sword bayonet, and (3) Knife bayonet. The spike pattern bayonet has become obsolete for its comparative ineffectiveness but the sword bayonet is very effective. A sword bayonet is 18″ inches in length and 1″ inch in width. The bayonet is composed mainly of two parts—the handle and the sword. At the joining of the handle with the sword there is ring of steel, which is known as bayonet ring. At the other end of the handle there is a nut catch. By this nut and the ring the bayonet is fixed on the rifle. Of the sword one edge is very sharp, while the other edge is blunt but the tip is pointed and sharp. The knife bayonet is used in Rifle No. 5 and is of 6″ length. The width of the blade of this bayonet is smaller than that of the sword bayonet and has two furrows near the blunt end.

3. Characteristics

To be good in the skill of bayonet fighting one must have the following qualities :

(1) *Strength* (Josh) : sufficient strength is required in the limbs of the body *i.e.*, hands and feet for operating the bayonet ;

(2) *Alertness* (Tej) : as bayonet charging is done within a very close range of enemy every one must remain absolutely alert to protect oneself from the sudden attack of enemy ;

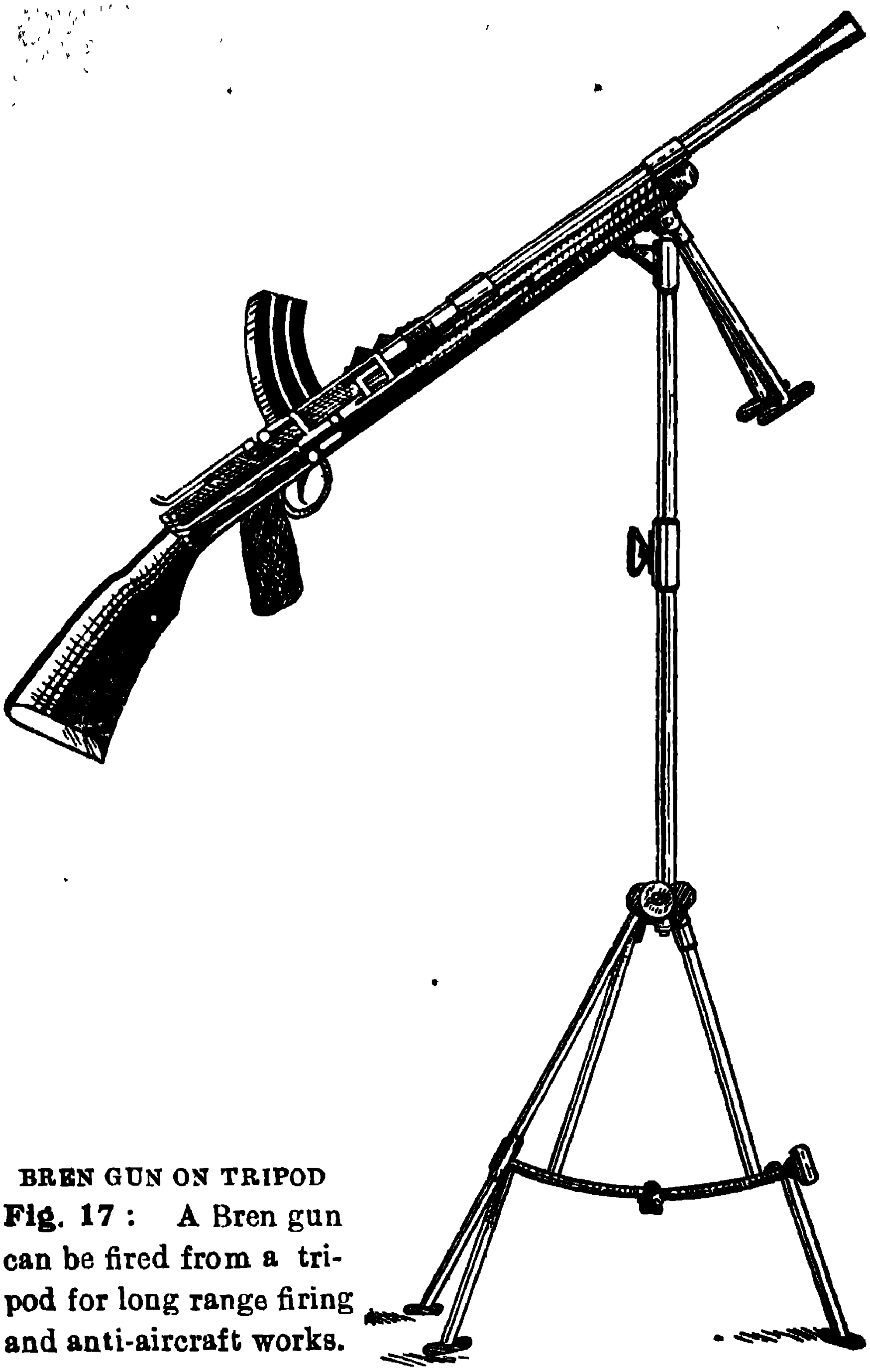
(3) *Determination* (Irada) : a very strong fighting determination is required to kill or to inflict severe injury to a man by bayonet ;

(4) *Mercilessness* (Be-Raham) : absolute mercilessness, at least temporary cruelty is required to operate bayonet by a man against another one.

Bayonet is advantageous mainly for the following reasons : (1) it makes sure casualties, (2) it involves no expenditure, (3) it makes a great threat to the attacked, and (4) it is a silent weapon.

The production and maintenance of bayonet also do not require much technique or expenditure.

The greatest limitation of this weapon is that its range is only a few yards. It also creates troubles for its user if it penetrates deep into the body of the attacked. Normally a bayonet must not go more than 3″ within the body of the attacked. It is also doubted that fixing of bayonet on the rifle slightly impairs the accuracy of the latter.



BREN GUN ON TRIPOD

Fig. 17 : A Bren gun can be fired from a tripod for long range firing and anti-aircraft works.

feature is the flash eliminator, a bell shaped piece of metal fitted over the muzzle, which hides the flash during night firing. Bren gun can be operated on a fixed line.

The immense value of Bren gun becomes sufficiently obvious in enclosed country, to enfilade hedges and roads, in street fighting, in providing a covering fire. The Bren gun is the backbone of defence.

The Bren gun is invulnerable to a great extent. It provides a very small target. The gun and the team of gunners are easily concealed and therefore difficult to locate.

The Bren gun is a gas operated air cooled weapon. By means of an ingenious valve method some of the gas produced by the propellant's explosion is brought back, so that it ejects the case of the cartridge that has been fired. The gas then escapes and a spring pushes a fresh cartridge into place ready for firing. Though the gun is air cooled, continuous firing soon over heats the barrel but that can be changed immediately by one man only and by a few seconds. No tool is required for this purpose, because the wooden carrying handle on top of the gun by which it is carried also serves as the handle the barrel.

As a bullet is fired from Bren gun some of the gas, formed during ignition of the bullet, pass through gas vent and gas regulator into the gas cylinder, where the gas push back the piston to the rear compressing the returning spring until the piston is checked by the piston buffer. The gun fires single shots when the piston gets caught there by the tripping lever head at the bent and until the trigger is pressed once again that will remain there. Trigger being pressed, the piston will be released and pushed forward by the strength of the returning plunger. But when the gun operates automatic fire the tripping lever head remains at lower level so that the movement of the piston is not arrested ; the forward movement of the piston is being caused instantaneously by the returning plunger *i.e.* return spring rod.

Bren gun can be fired being placed on its bipod attachment, or also from a tripod stand. The tripod allows a traversion of 58° degrees and an elevation of 19° degrees. The weight of the tripod itself is 30 lbs. A tripod has an extra leg, which converts it promptly into an effective anti-aircraft mounting. Besides these, the gun can be used in the field, from the trench or from vehicles.

There are four marks of the Bren gun—Marks 1, 2, 3 and 4. Marks 1 and 2 are heavier than the Marks 3 and 4. Usually Marks 1 and 2 are used by infantry, while air force and navy use Marks 3 and 4. Marks 1 and 3 are provided with backsight drum, while Marks 2 an 4 are equipped with tangent leaf sight.

Under pressure of events, large number of sten guns were manufactured during war period and various modifications have been made. There are six marks of the sten guns of which the Mark V is considered to be the best for its reliability. The external differences beween the mark are not so significant. The characteristic features of the different marks (MK) are enumerated below.

MK I : Wooden fore-end with handgrip folding forward ; skeleton butt, fixed barrel with full length casing.

MK II : The barrel can be separated. No part of this Sten gun is made of wood. Its foresight is fixed at the fore end of the breech casing.

MK III : The barrel cannot be separated, the barrel is continuation of breech casing and a rib running full length along the top.

MK IV : This is not used by Indian army.

MK V : The butt is made of wood. It is provided with foresight protector, and this can be zeroed. The bayonet of MK 4 No. 1 Rifle can be fixed in this type of Sten gun. The Sten gun is provided with a plate, which enables the firer to operate it even without butt.

MK VI : Instead of normal barrel there is a special unit fitted with this mark which absorbs noise of the explosion.

The diameter of the barrel of the sten gun is 9 m.m. ; and the length of the barrel is also considerably small, the distance between the base of the backsight and foresight being 19.44" inches. The barrel is cleaned with flanellate, the measurment of the dry flanellate being 4" × 3" inches while that of the flanellate meant for oiling is 4" × 2" inches.

The sten machine carbine can fire upto 100 yards but its battle effective range is upto 30 yards.

There are two types of magazines—unmodified and modified. A modified magazine can easily be identified by the two brass pins, which are fitted on the sides of the magazine. An unmodified magazine can take in 30 rounds at a time but usually 28 rounds are filled in, while the capacity of a modified magazine is

19 rounds but 18 rounds are filled. The magazine of sten gun are long and rectangular in shape. The cartridges remain in two vertical rows within these. The magazine spring is very hard and it is very difficult to fill in the magazine by hand. Usually the help of an extra equipment, called magazine filler, is taken for completely filling the magazine. Magazine fillers are also of two types—Mark 1 : it looks like a bird, and Mark 4 : it looks like a box.

A bullet being fired leaves the muzzle of a Sten gun with the velocity of 1,200 feet per second.

Like Bren gun Sten gun also can fire single shots and bursts.

Sten guns are used only by the commanders of certain sub-units.

13

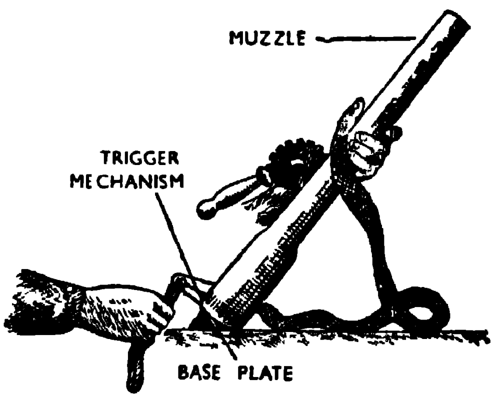
2″ MORTAR

1. Introduction

It is the small artillery of a platoon commander. It is small, handy, and very effective on enemy situated behind certain covers through which fire of small arms cannot be operated.

2. Description

It is a small, light weight, smooth bore, muzzle loaded weapon and it has trigger mechanism. It consists mainly of (a) barrel, (b) barrel cover, (c) carrying handle, (d) steel pad, (e) firing pin, (f) firing pin spring, (g) barrel catch, (h) firing leaver, (i) spade base plate. It can be carried by a carrier handle, which is attached on the barrel and also by sling. It can be so mounted that the shock of recoil can be absorbed by the ground.



2″ MORTAR

Fig. 23 : It is a very effective, small and light weapon but two men are required to operate it.

3. Characteristics

Its chief characteristic is that it can open fire directly or indirectly on the target. This is possible for the high trajectory through which the shells of the mortar can pass. There is no mechanical arrangement to adjust the degree of elevation but that is to be done by the skill of the fire. A mortar can be concealed easily.

Two men are required to operate it. One of these two, carries the mortar and the other one carries the ammunition.

It is small and light, its length being 19·94″ inches and the weight being approximately 12 lb. 8 ozs. the diameter of its barrel is approximately 2·002″ inches, but commonly it is called 2″ mortar as the diameter of the bombs fired by it is 2″ inches. It can fire four types of bombs—(1) High Explosive (H.E.), (2) Smoke, (3) Coloured Smoke (yellow, green, red and blue), and (4) Para Illuminating. Bombs are not only different in purposes but also in characters. The purposes and characters of the different·types of bombs are given here.

H. E. : It is used against bunker, but most effective against the enemy, whom on the open ground or in the soft skinned vehicles. It is provided with a sefety cap. It can easily distinguished by its light or dark brown colour, Its weight is approximately 2½ lbs. The killing range being 8 yards in all directions from the point of burst, while the dangerous zone is 250 yards in all directions from the point of burst.

Smoke : It is used to make smoke screens. The smoke it creates, usually lasts for two minutes. Therefor, a large number of shells are to be fired for making an effective smoke screen. In creating smoke screen the direction and speed of wind should also be considered. It is provided with three screws at the base and the word 'smoke' is written on the body, its body is green painted. Its weight is approximately 2 lbs.

Coloured Smoke : It is used to make smoke of different colours, usually for transmitting Signals. The smoke it creates, usually lasts for 9 to 14 seconds. On the body of the bombs different signs are painted to indicate different colours. Its weight is 1 lb. 1½ ozs.

Para Illuminating : It is used to illuminate certain area to observe the ground in detail. The illumination remains for 30 seconds. But if it is fired at angle of 80° it can go upto a maximum height of 600 ft. and in that case the light it creates will last for two minutes. The shell is black in colour and on its body 'P' of brass is attached. Its weight is 1 lb. 1½ ozs.

A mortar can fire three to four bombs per minute. Bombs are carried in containers. Each container can accommodate six bombs at a time.

When H. E. bombs are fired a volume of smoke comes out from the barrel of the mortar and this smoke rises upto 15 feet in height. The smoke is also associated with flash, which also goes to the same height. This flash makes the concealment of 2″ mortar difficult during night.

The battle effective range of a 2″ mortar is 200 to 525 yards. The killing range is 8 yards in all sides from the point of burst. The safety limits, overhead and on sides, are 150 yards from the firer.

The greatest limitation of this weapon is its smooth bore, due to which is cannot produce pinpoint fire.

The mortar is to be used in a planned way and judiciously. But the firer must be careful to see that he does not drop the shells on own troops.

14

3″ MORTAR

1. Introduction

It is the artillery of the battalion commander. In a standard Indian Infantry battalion there are six 3″ Mortars and these are available for use anywhere the battalion commander likes.

2. Description

This mortar is bigger and heavier than the 2″ Mortar. The principle and mechanism of this is essentially same with those of the 2″ Mortar. Usually this type of mortar and its ammunitions are carried by tracked carriers or by 15 cwt. trucks, man can carry it only for a short distance. It is usuallay mounted on a mechanical support and the base plate has pointed studs, which are fixed on the ground, and the recoil is absorbed by the ground.

3. Characteristics

The chief characteristic of the weapon is the high trajectory through which the shells of it pass. This has enabled to engage it against targets behind all types of covers. For this reason alone it is usually employed for indirect fire and very seldom for direct fire. There is another reason of not engaging for direct fire —its flash. Unless it is hidden behind a high cover it can be easily detected by the enemy for its flash. As it carries on indirect fire it can continue firing when blinded by smoke, fog or darkness. This is also called 'Trench Mortar.'

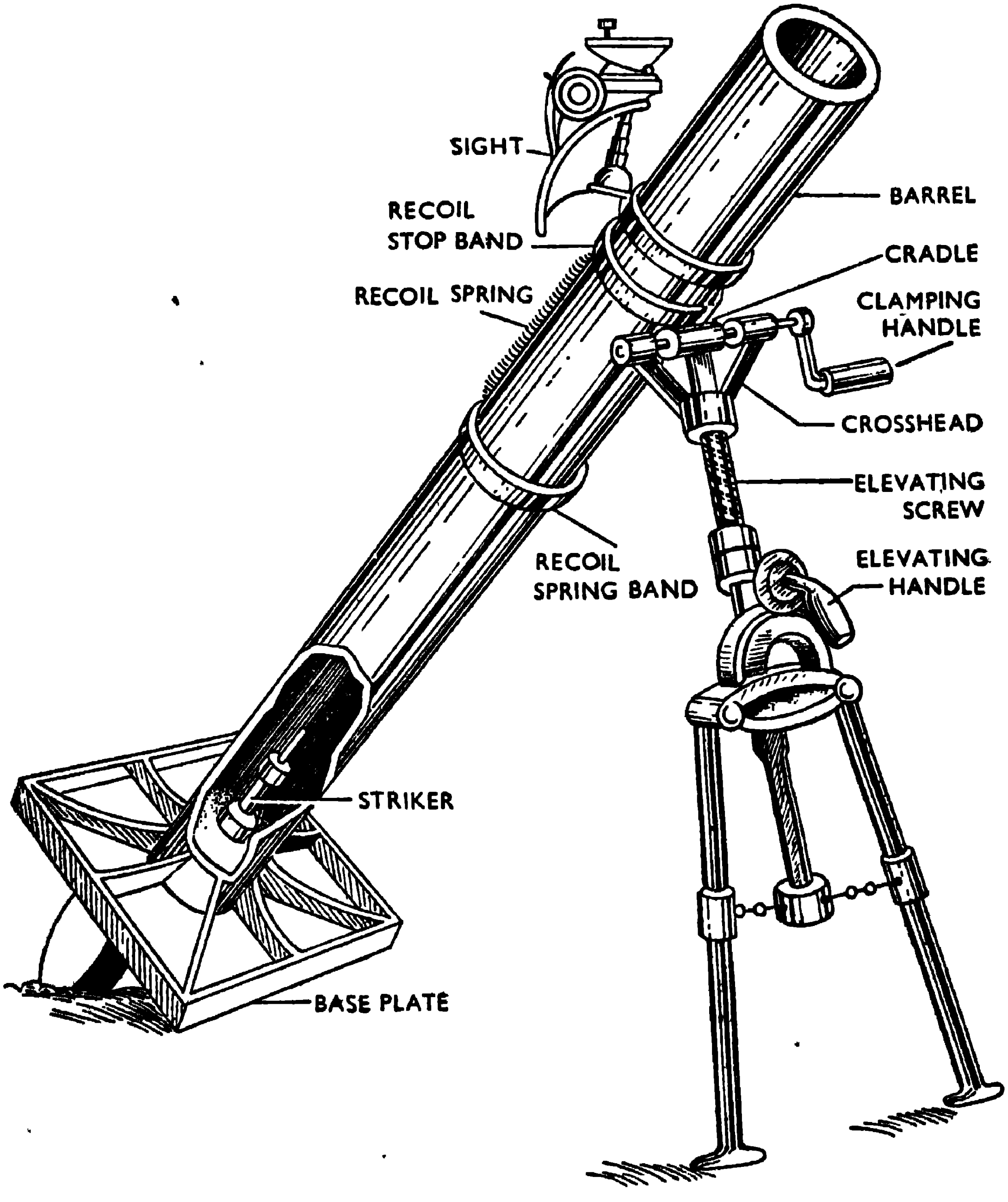
A team of four men (1 N.C.O. and 3 sepoys) is usually employed to operate it. Of these four men one is the commander, while No. 1 man carries the Base plate and the sight, No. 2 man carries the Bipod.

The length of the barrel is 51″ inches and along with the spare parts it weighs 44 lbs. But the weight of the bipod alone is 44½ lbs. and the base plate and the sight weigh 37 lbs. The diameter of the barrel is 3″ inches.

It can fire two types of bombs—(*i*) High explosive (H.E.), and (*ii*) Smoke. The weight of the bombs is 10 lbs. Bombs are carried in bomb carriers. The weight of an empty bomb carrier is 20 lbs. and it can carry six bombs.

It can normally fire 7—10 bombs per minute but its slow rate of fire is 3 bombs per minute while the rapid rate is 12 bombs per minute.

It is a very long range weapon, and with charge one it can



3″ MORTAR

Fig. 24 : This is also called 'Trench Mortar'.

fire upto 15,00 yards but fitted with charge two its range varies from 1,000—2,775 yards. The time of flight of the bombs also vary according to the charge. When a mortar—fitted with charge one—fires, the bombs take 20 seconds' time for their flight, but if the mortar is equipped with charge two the time required for the flight is 30 seconds. This mortar can also traverse an angle of 54° degrees. Thus it can easily be employed against a wide area at a long distance. As this mortar can traverse a big angle, naturally area of its beaten zone also becomes extensive.

The greatest limitation of this weapon is its vulnerability to damp. The barrel and the bombs get greatly damaged by slightest damp. Hence these must always be kept dry.

This weapon is used as a supporting fire for attack, and in defence as covering fire against dead grounds, reverse slopes, etc. and to deliver harassing fire on the enemy.

15

INFANTRY ANTI-TANK WEAPONS

1. Introduction

The development of Tank in the First World War created a great havoc. To meet the challenge of this menacing monstrous car by infantry the following weapons were developed by the Second World War—(*i*) *Projector Infantry Anti-Tank* (PIAT)—developed by British ; (*ii*) *Bazooka*—designed by Americans ; and (*iii*) *Panzerfaust*—a German weapon.

PIAT and Bazooka have been briefly described below.

PROJECTOR INFANTRY ANTI-TANK (PIAT)

2. Description

It is a light weight weapon, which can be easily carried forward by the infantry soldiers to provide them with close quarter protection against ememy tanks.

This also project smoke and anti-personnel bomb to very considerable range.

The PIAT is a cylindrical steel weapon enclosing a spring and is attached with a very narrow elongated snout. It is fitted with a 'spigot' *i.e,* a post containing the firing pin, where the round of the ammunition fits.

A special front support has been developed for the PIAT. With the aid of this front support the PIAT can be used for low or high angle fire as mortar or this can be fired from the shoulder. When it is used as a mortar, the shoulder piece is rested on the ground and a clinometer is attached to the left of the rear sight. It has got two types of sight—(*i*) pillar front, this is adjustable, and (*ii*) the tangent rear sight, it has 70 and 100 yards apertures.

3. Characteristics

The overall length of the PIAT is 39″ inches. The maximum range is about 750 yards, but its battle effective range is only 100 yards. The weight of the PIAT is 32 lbs. and the weight of its bomb is 3 lbs. Bombs fired by PIAT leave the weapon with the muzzle velocity 450 feet per second.

The release of the safety catch and pressing the trigger will release the spring mechanism to fire the bomb. The spring develops over 200 lbs. pressure. The released springs carries the spigot forward, which enters the tail of the bomb and fires a cartridge there. The explosion causes the spring to compress and the PIAT is cocked once again automatically. This can be operated by one man only.

BAZOOKA

4. Description

Bazooka is the more familiar name of the Rocket Launcher. There are two types of Bazooka—A.T.M.1. & A.T.M.9.

Bazooka is a platoon weapon and can be operated by a team of two men. It consists of an open tube, fitted with a soulder stock. A front sight is welded to the barrel near the muzzle and the sight is equipped with a 4 studs for aiming at range of 100, 200, 300 and 4 yards. The top stud is the 100 yard one.

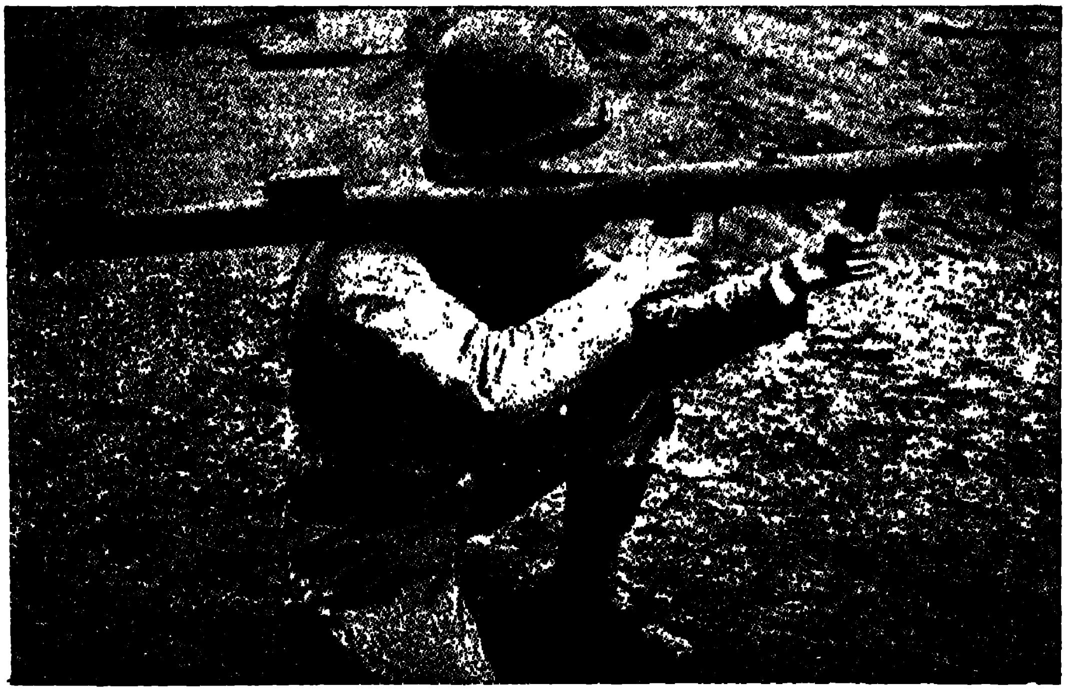
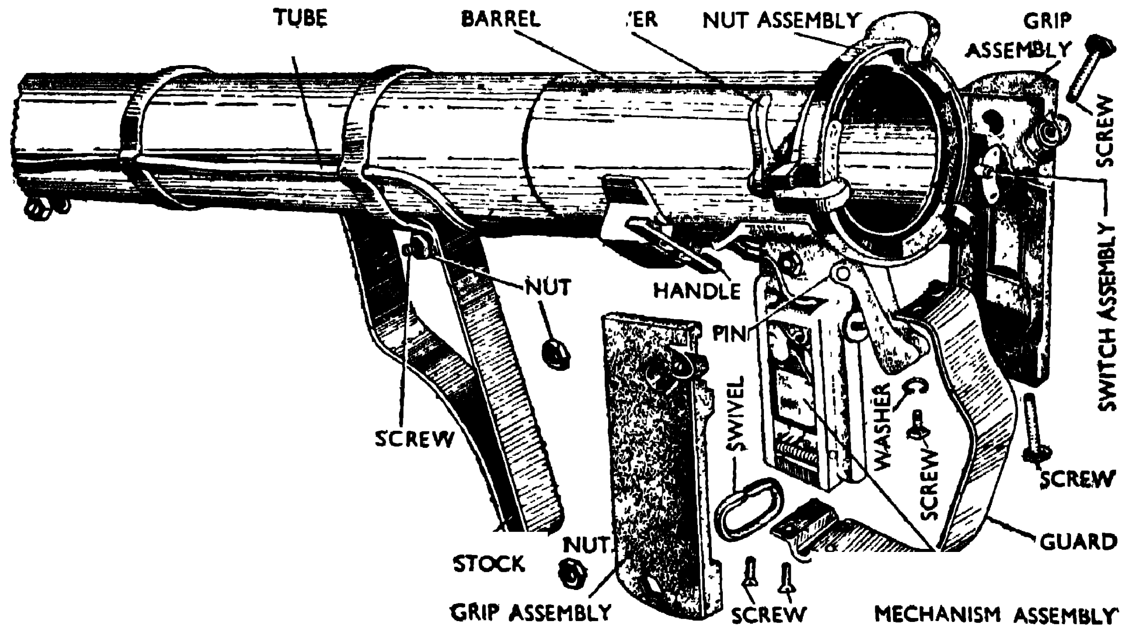


Fig. 25 : Bazooka in firing position.

The rear sight is provided with a turning arm and is placed about 15" inches from the muzzle. The base of the sight is welded to the barrel and is fitted with a mechanism to hold the sight at any desired position. There is a square notch on the rear sight which must be lined up with the proper stud on the front sight for the range at which it will be fired.

There are two handgrips at the underside of the tube. The forward one is about 8" inches from front end and is meant only for supporting the Rocket Launcher, while the rear one is situated at about 8" inches from the front one and carries the trigger mechanism.

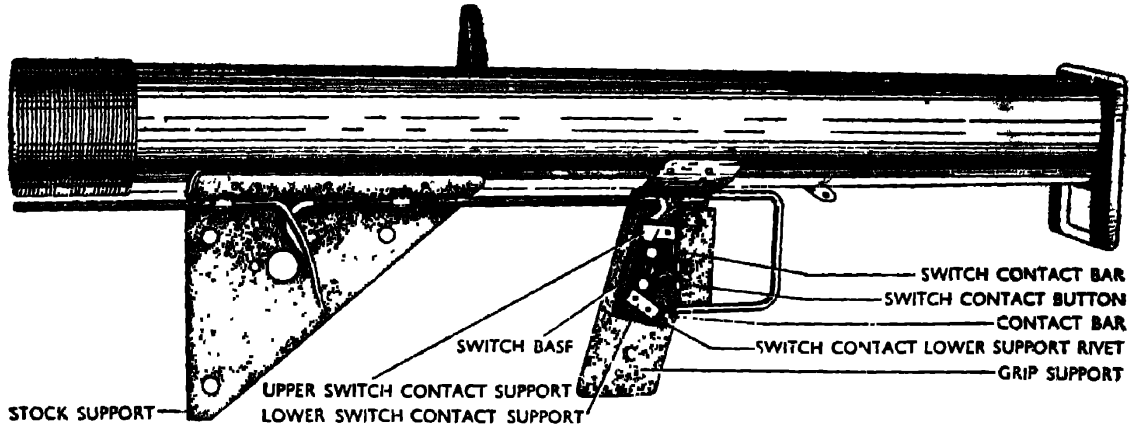


BAZOOKA

Fig. 26 : The part of ATM 9, showing the parts.

There is a wooden shoulder stock at the rear of the trigger mechanism. On the bottom of this wooden stock there is a hinged plate. The plate covers a compartment, in which are stored two small dry batteries. One of these batteries is connected to the electrical circuit of the Bazooka, while the other one is spare. There is also an electric lamp in the same stock. Whenever the trigger is squeezed lamp lights up.

At the rear of the shoulder stock there is a housing on the top of the tube. Within the housing remains a contact mechanism. The safety lever is situated at the rear of the housing.


SWITCH CONTACT BAR
SWITCH CONTACT BUTTON
CONTACT BAR
SWITCH CONTACT LOWER SUPPORT RIVET
GRIP SUPPORT
SWITCH BASE
UPPER SWITCH CONTACT SUPPORT
LOWER SWITCH CONTACT SUPPORT
STOCK SUPPORT

BAZOOKA

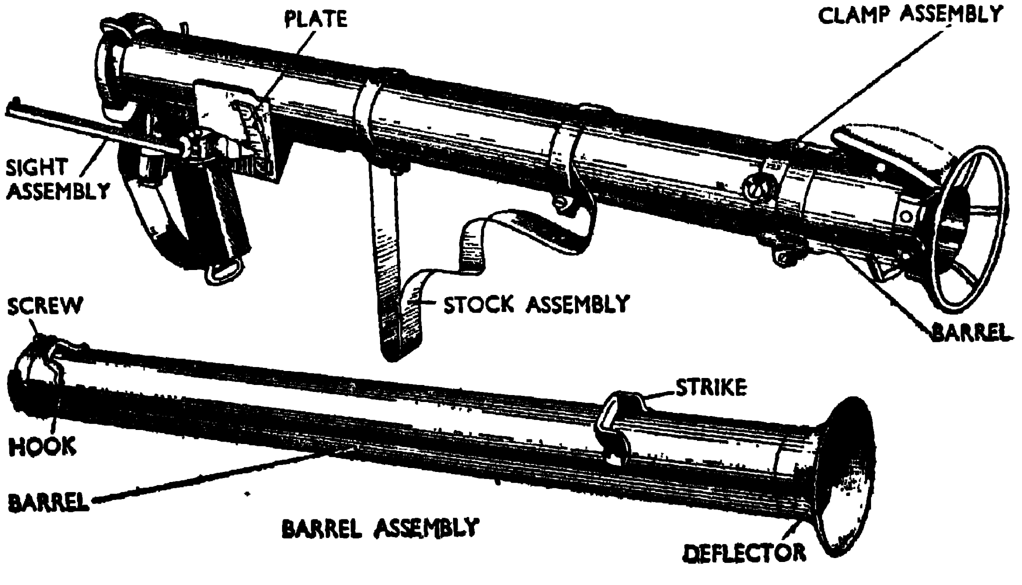
Fig. 27 : Front part of ATM 1, showing various parts, particulary the electric circuit.

A tail latch projects over the rear opening of the tube.

There is a spring metal tube around the Bazooka itself just above the stock. It permits circulation of air in the barrel and also affords protection to the firer against the heat of the launcher tube.

5. Characteristics

The chief characteristic of this weapon is that it is equipped with electric mechanism for manipulation and it is a rocket-projected weapon.



TWO TYPES OF BAZOOKAS

Fig. 28 : The upper one shows the rear part of a ATM 1 and the lower shows the rear part of ATM 9.

It is light and can be fired from any shoulder of the firer ; and the projector is so supported that the blast of the rocket goes behind the fire. Its mechanism is such that before the projectile reaches the mouth of the tube, its propellant charge gets exhausted, and thus there is no danger for its firer.

The diameter of the bore is 2·36″ inches. During the Korean War, Americans used Bazooka, the diameter of the bore of which was 3·5″ inches. The length of the tube of the Bazooka A.T.M.1 is 54″ inches while that of the Bazooka A.T.M. 9 type is 61″ inches. The two types of Bazooka differ mainly in the pattern of barrel couplings.

16

GRENADE

1. Introduction

Grenades are the small bombs used by the infantry. Grenades are very effective in close quarter battle. It is particularly useful in street fighting, trench fighting, for clearing houses, dugouts, caves, etc. One grenade can take a toll of many as the shell of a grenade bursts into several sinister fragments. The grenade is of course an old weapon. It is an outcome of the Mills bomb. It played a prominent role in the First World War. It was proved in the Spanish Civil War that this can also be used with success against light tanks.

2. Description

There are several types of grenades and they perform various functions. Of all these types No. 36 High Explosive Grenade is used commonly by Indian Infantry. Every soldier carries grenades.

It is small like an orange, light and effective. The main parts of a grenade are (*a*) Base plug, (*b*) Barrel-shaped casting, (*c*) Shoulders, (*d*) Lever, (*e*) Safety pin, (*f*) Striker, (*g*) Striker spring, (*h*) Sleeve, (*i*) Sleeve detonator, and (*j*) Charging screw. When the grenades are fired by rifle another accessory, called Gas shield, is attached below the base plug.

3. Characteristics

Its weight is approximately 1 lb. 10 ozs. It can be thrown by hand upto a distance of 35 yards. It can also be fired from a rifle (Grenade Firing rifle) by means of a discharger cup upto a distance of 200 yards. Ballisted cartridges are used for firing a grenade with rifle. Its killing range is 9 yards in all directions from the point of burst. A four second fuse is used for hand throwing while a seven second fuse is used for firing from a rifle.

17

CHEMICAL WARFARE

1. Introduction

It is not only that the high explosives are used in war but there are chemicals also which can cause great damage to troops behind the line and to civilians. A chemical bomb can affect an area which is many times greater than the area which can be affected by a similar sized high explosive bomb. These chemicals rob troops of their power of defence and destroy the civilian morale. The chief agents of chemical warfare are *gas*—used in solid, liquid or vapour form, and *incendiaries*. Although the use of gas was prohibited by Geneva Convention, there is no doubt that if enemy feels the necessity of using gas, he will use it.

2. Purpose of gas attack

Gas produces physiological incapacitation effected by chemical reactions with the tissues of the body through inhalation or direct contact with skin. Few gases are likely to cause death except in high concentrations. Gas is mainly used for (*i*) harassing the enemy, (*ii*) neutralizing the efficiency of enemy and consequently demoralizing him, (*iii*) ground contamination with the purpose of making the ground almost impassable without suffering heavy casualties.

3. Methods of gas attack

Usually gas attack can be delivered in the following ways.

(*a*) *Artillery shell* : Shells containing gas can be fired by artillery guns. But as these shells can contain little amount of gas, a large number of shells are to be fired.

(*b*) *Mortar shell* : Like artillery guns mortars also can fire gas shells.

(*c*) *Projectors* : Projectors are also used to fire large drums containing gas. Projectors can throw gas drums upto 2,000 yards.

(*d*) *Cylinders :* Gas can be released from cylinders whence it is carried by the wind over the enemy positions. Gas, released in large quantities from cylinders, may form clouds, and these clouds may be effective even upto 15,000 yards downwind from the point of emission.

(*e*) *Bombs :* Gas may be loaded into aircraft bombs which may vary in weight between 30 lbs. and 3,000 lbs.

(*f*) *Spray :* Chemicals in liquid form may be sprayed from aircrafts over open areas.

4. Factors affecting gas attack

The effectiveness of gas attack depends largely on weather condition, *e.g.*, (*a*) atmospheric temperature, (*b*) wind, and (*c*) rain.

(*a*) *Temperature :* Heat expands the volume of gas and makes it lighter, as a result of which gas goes up and gets dissipated in air. Usually the temperature of atmosphere decreases with height above the ground level. This condition is called 'temperature lapse'. But on clear nights during winter and also sometimes on day the temperature increases with height above the ground level. This condition is known as 'temperature inversion'. Before delivering gas attack the condition of the temperature of the target area should be considered.

(*b*) *Wind :* Gases, particularly light gases, will be blown away from the intended target if there is a strong current of air. A light breeze under twelve miles per hour does not affect, but gas should not be used in winds above fifteen miles per hour. But wind usually cannot reduce the affect of persistent liquids.

(*c*) *Rain :* Downpour of rain usually leach the gas and wash it. But light dizzling cannot affect.

An ideal day for a gas attack would be one of those met in autumn.

5. Classification of war gases

War gases may be broadly divided into two main groups :

persistent, which is generally liquid giving off vapour until it dries up and *nonpersistent*, which is usually like smoke. Further, the gases are classified according to the effects they produce upon the human body as follows : (*a*) vesicant or blister forming gases, (*b*) nose irritant gases, (*c*) lacrimator or tear causing gases, (*d*) chocking or lung irritant gases, (*e*) blood irritant gases, and (*f*) toxic or death causing gases.

7. Incendiaries

Apart from gases other chemicals are also used which are capable of causing fire to material and personnel. These are known as incendiaries. As soon as incendiaries come in contact with air they ignite themselves and produce sufficient heat to set fire to ordinary inflammable materials. As incendiaries are more effective than the high explosives in causing fire they found their places of pride in the second World War.

Incendiaries can broadly be classified as follows :

(A) Spontaneously inflammable chemicals *e.g.*, Phosphorus and Sodium.
(B) Inflammable materials *e.g.*, Celluloid, Resin, Pitch, etc.
(C) Oxidizing combustible metals *e.g.*, Magnesium.
(D) Metallic oxides *e.g.*, Thermites, Thermates, etc.

Of all these, phosphorus is the most important one. As soon as it comes in contact with oxygen it ignites itself and burns all combustible materials. It can also stick to the clothings of men and for this reason it is far more effective.

Celluloid, pitch, petroleum, oils, carbon-disulphide, wood distillation products, are not spontaneously inflammable but help as secondary liquid agents being highly inflammable.

Oxidizing combustible metals are incendiary mixtures containing chemicals like magnesium, barium, potassium with carbon, sulphur, etc. Magnesium being heated to ignition point combines with oxygen and burns with a dazzling white flame which is very difficult to put out.

To cause conflagration, thermite mixture of aluminium and iron oxide are ideal. Being ignited it produces terrific heat. For war purpose thermites are also mixed with other chemicals, when they are called thermates.

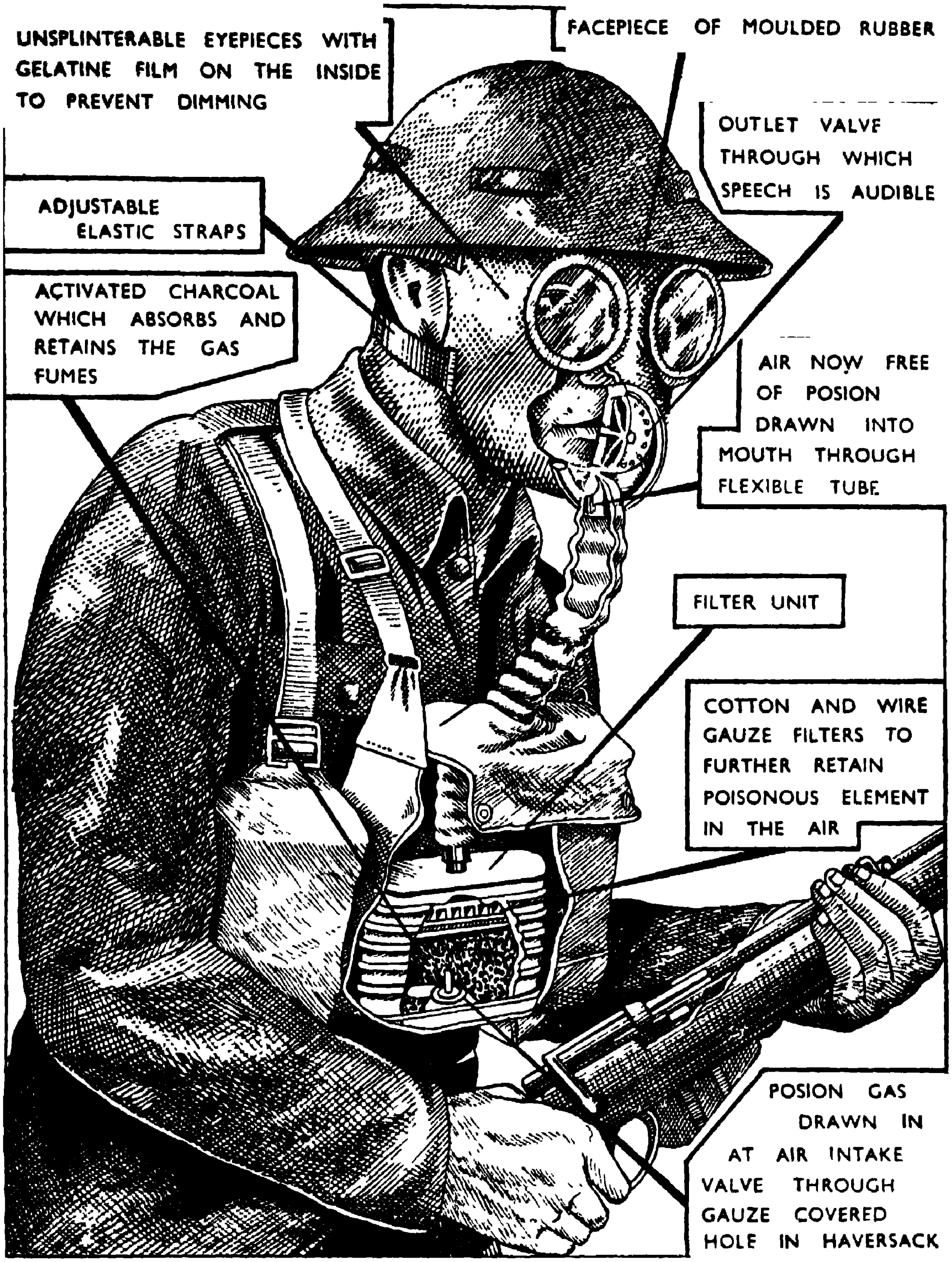
During the last war, researches on incendiaries have proved that the jellied oils like (*a*) saponification of gasolene in butylmethacrylate, (*b*) saponification of gasolene in naplam, are best suited to the purpose, as they can be carried safely and are also highly effective.

8. Personal Protection

Every individual is personally responsible for his own protection against gas. Individuals in the field are usually equipped with the following articles for this purpose.

(A) *Respirator* : It affords complete protection to the eyes, nose, throat and lungs against all known war gases except ammonia and carbon monoxide, A service respirator is consisted of three parts—(*i*) the face piece, which is made of rubber sheet moulded to the shape of a face. It is provided with six adjustable elastic bands joined to a rubber pad at the back of the head. A metallic protuberance, the valve holder, is in the front of the face piece. Through this valve the purified air from container passes to the face piece and also through this valve escapes the breathed out air. Eye pieces, made of unsplinterable glass, are screwed with the face piece. A corrugated rubber tube, the flexible connecting tube, is present on the top of container. The container consists of an outer casing containing a non-return valve, which opens to admit as wearer breathes in and closes as breath is expelled. A filter of muslin present in the container prevents the passage of finely divided smokes. Another compartment of the container is filled with activated charcoal which absorbs gases and purifies the air for the breather. All parts of a respirator are carried in a waterproof canvas haversack, which is divided in three compartments. Two of the compartments are used to hold the face piece while the third one contains anti-dim compounds for the glass eye pieces, antigas goggles, etc.

(B) *Antigas eye-shields* : It is required to protect the eyes from the attack of the liquid gases.


UNSPLINTERABLE EYEPIECES WITH GELATINE FILM ON THE INSIDE TO PREVENT DIMMING
FACEPIECE OF MOULDED RUBBER
OUTLET VALVE THROUGH WHICH SPEECH IS AUDIBLE
ADJUSTABLE ELASTIC STRAPS
ACTIVATED CHARCOAL WHICH ABSORBS AND RETAINS THE GAS FUMES
AIR NOW FREE OF POSION DRAWN INTO MOUTH THROUGH FLEXIBLE TUBE
FILTER UNIT
COTTON AND WIRE GAUZE FILTERS TO FURTHER RETAIN POISONOUS ELEMENT IN THE AIR
POSION GAS DRAWN IN AT AIR INTAKE VALVE THROUGH GAUZE COVERED HOLE IN HAVERSACK

A SOLDIER EQUIPPED WITH A RESPIRATOR

Fig. 30 : A respirator has been illustrated in detail. It affords complete protection from all the nonpersistent gases, and partial protection from some of the persistent gases.

(C) *Antigas caps*: It affords protection against spraying of gas.

(D) *Antigas ointment*: There are two types of ointments which are used against blister forming gases.

(E) *Gas detectors*: These are halfsleeves which are worn on the upper arm of both arms. As drops of gas fall on them they take red colour.

(F) *Waste cotton*: This is used for removal of liquid gases and ointments from the skin.

9. Personal decontamination

The responsibility of an individual does not end only in protection but everyone is responsible for personal decontamination also. The idea of personal decontamination is actually removal of the contaminated clothings and application of antigas ointment. The sequence of the work should be as follows :

(*i*) Removal with waste cotton of free liquid from exposed skin ;

(*ii*) Application of antigas ointment on affected parts of the body ;

(*iii*) Removal of the contaminated eye shields and preparation of fresh eye shields for further use ;

(*iv*) Clearing of any free liquid from the clothes and equipments.

It is safe to apply antigas ointment on the part of the body which was covered by clothing upon which liquid blister forming gas has fallen. In necessary cases, clothings should be changed.

18

NUCLEAR WAR

1. Introduction

Since the early dawn of human civilization, man has constantly endeavoured to unveil the mystery of nature all around him and utilize the tremendous power working in his environments. Through unceasing efforts mankind has acquired amazing amount of detailed knowledge about the elemental forces like water, fire, the minerals of the earth. But with each step of his progress, man has become all the more thirsty about the knowledge of *matter* and *energy.*

2. Matter and Energy

To understand the significance of those two words it is essential to have some basic idea. Matter and energy, the former of which is probably a phase of the latter, are the two most fundamental phenomena of the basic sciences, physics and chemistry.

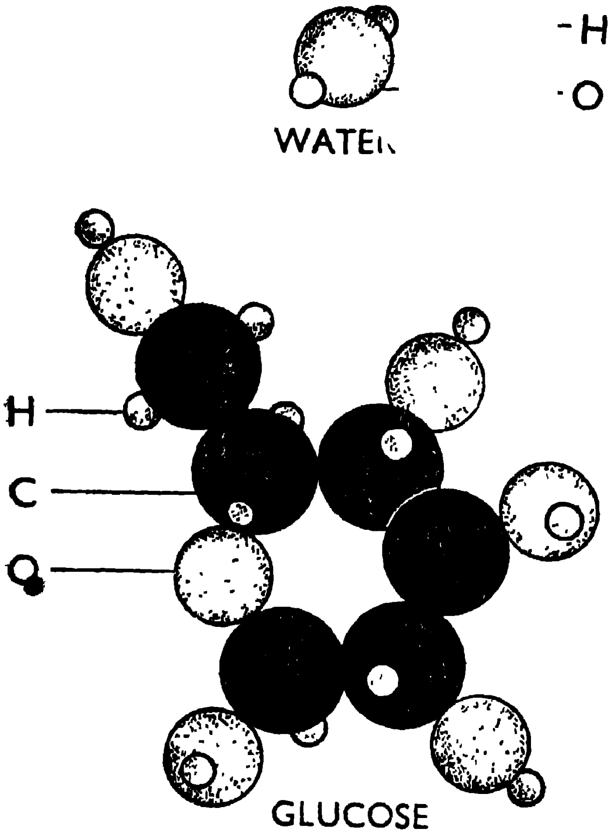
Matter

Matter may be defined as anything that occupies space and has mass or simply any substance that has weight. It may be *solid* as ice ; or *liquid* as water ; or it may be *gaseous* as steam. These are the three states of matter.

Constitution of Matter

In nature matter exists in many different forms. It differs in kind and displays a great variety of phenomena. Whatever may be the nature and ultimate structure of matter, some common forms are made up of one kind only, known as *elements*, which may be solid such as gold, silver, iron ; liquid as mercury, and gaseous like hydrogen, oxygen, etc. Of the 92 elements known, 90 are fairly well known, and 2 are believed to exist. Each of these exists in its simplest form, but most of the matter exist not as a single kind but in the nature of a *compound*, formed by the union of two or more unlike kinds of elements such as common salt water and glucose, etc.

Molecule and Atom : A sample of any compound substance, suce as a piece of salt, may be broken into smaller sizes and the process of division is continued until the salt particles are beyond the limit of vision. Ultimately a fargment may be conceived that can no longer be broken without producing a complete change of properties. This smallest partical of any substance is called a *molecule.* When molecules are broken, into still smaller particles, with consequent change of chemical and physical properties, the resulting fragments are called *atoms.* Atoms are the smallest units in nature and are the smallest units involved in a chemical change. Atoms are believed to be the smallest unit of matter. A molecule of sodium chloride, for example, is divisible into two atoms, one of sodium and one of chlorine. All matter on earth is composed of ***atoms***, of which 92 kinds are known uptill now.

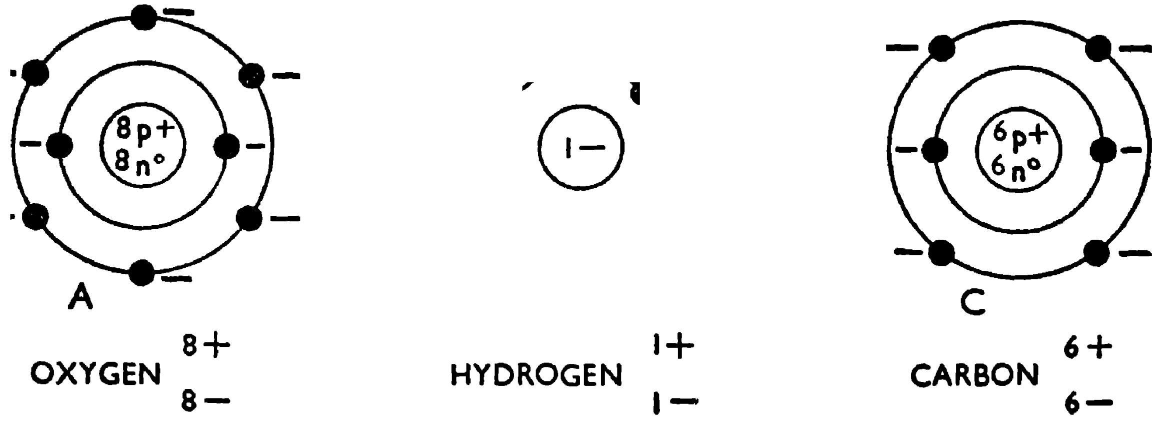


MOLECULES OF WATER
AND GLUCOSE

Fig. 31. Models representing the molecular structures of water (2 atoms of H combined with 1 atom of O) and glucose (12 atoms of H combined with 6 atoms of C and 6 atoms of O)

The internal organization of an atom is very complex and may be compared to a miniature solar system. Each atom has a ***nucleus*** that is the centre of a system, just as the sun is the centre of our solar system. In the same manner like the planets revolving around the sun, particles known as ***electrons,*** revolve around the nucleus and carry *negative electric charges.* All the electrons do not move in the same plane, not in the same direction. Particles known as ***protons*** are present in the nucleus and carry ***positive***

electric charges. An atom may also have ***neutrally charged*** particles, ***neutrons***, in the nucleus. The weight of proton and electron is not identical, but neutron and proton have almost equal weight.



ATOMS OF O_2, H_2 AND C

Fig. 32. Diagram illustrating the atomic structure of oxygen, hydrogen and carbon. These atoms are neutral unless they give up or add an electron

Ions : An atom is neutral because the negative charges of the electrons exactly balance the positive charges of the nucleus. With the gains or loss of an electron, the electric balance of an atom is disturbed. It becomes negatively charged if it gains an electron ; if it loses an electron, it becomes positively charged. These electrically unbalanced particles are *ions*. They carry positive or negative charges of electricity. Objects carrying like charges of electricity repel each other, whereas objects which carry unlike charges, positive and negative, attract each other.

Scientists were convinced that the heat of the sun and the energy that made everything move was hidden in the atom, and if this energy could be unlocked man would have such power, which he could not conceive of.

3. Research and development

With this conviction people were going steadily into the details of matter and energy. As the records show, the advancing science passed from molecule to atom more than a century ago and from the atom to the electrons and nucleus it has gone nearly sixty years ago.

Previously the preponderant idea was that neither matter nor energy could be destroyed nor could be changed. In 1905, Albert Einstein established theoretically that matter and energy are interconvertible.

But a real advance in practical side was made by Earnest Rutherford. He established that most of the atomic projectiles could go cleanly through the thin, solid wall of metal and he also estimated that if the nucleus was magnified to the size of small nut then the diameter of the atom would be almost a mile.

It is in the year 1919, he succeeded in splitting an atom. Prof. Ernies Fermi, showed in 1939, how easily a slow neutron could slip into an atom and could cause the bursting of its nucleus with release of terrific energy. In the same year scientists discovered a new element, called Uranium 235 (U_{235}), which if isolated could liberate energy at such an unbelievable rate, that one pound of U_{235} was eqlivalent of 5,000,000, pounds of coal. But the most significant advance was made by a group of German scientists—Hahn, Meitner, Frisch and Strasmann. Hahn and Meitner tried to fire slow speed neutrons at the Uranium and observed a new element having at an atomic weight only little more than half the weight of Uranium, was produced. At this time Meitner was forced to leave Germany of Hitler, as the ancestry of her was found not to be 'aryan'. On her way to Stockholm, Meitner concluded that if a Uranium atom of 92 positive particles were to be split into two parts, one of which consisted of 56 and formed the new element of Barium, and from the other 36 particles, the amount of atomic energy released would be hitherto undreamed of—approximately 2,00,000,000, electron volts per atom i.e. an energy 5,000,000 times greater than that released in burning of coal. On arrival at Stockholm, she transmitted this idea to her friend Frisch, who happened to be the son-in-law of Prof. Neils Bohr. Prof. Bohr was then in America, carrying on researches with many other collaborators. Frisch cabled the news recieved from Meitner to Prof. Bohr. Prof. Bohr started repeating the work of Hahn-Meitner, in America, and also arrived at the same results.

The moment this great mystery of Barium was solved, another big problem started baffling the scientists. If the Uranium is split into two parts, a number of high speed atomic bullets in the form of neutrons would be released in this process from the core of the atom. If these neutrons were to be slowed down, they should start a cyclic action in the manner of the string fire crackers, one split atom automatically setting off another, which in turn would set off a third and so on, resulting in a terrific explosion. But practically, the scientists observed, nothing such happened—this led them to believe that something must existed which extinguished the cosmic fire. After a prolonged investigations Prof. Bohr concluded that U_{235} started the atomic fire but U_{138} was the fire extinguisher. Then the problem resolved to separate U_{235} in pure form. This problem, of course, was a formidable one. In 1940, Dr. Alfred O. Nier succeeded in separating U_{235} in pure form. It was now established that more neutrons were produced when the uranium atom was broken and those released neutrons could break down neighbouring uranium atoms so that a chain of the process could be set, and that too with tremendous explosive force.

4. Radiation

It has been described earlier that the nucleus may become unstable. Usually in those nuclei where neutrons and protons happen to be in excessive number, a tendency of atomic breaking become recognizable—e.g. the nuclei of Uranium, Thorium, Radium, etc. Different types of rays emmit from the atom as the nucleus starts breaking. The emission of rays as associated with breaking of atom is called *radiation* and different types of radiated rays are known as Alpha rays, Bita rays, and Gama rays. The phenomenon of breaking down of atom is called *radio-activity.*

The nature of these rays are also different—the alpha rays consists of positively charged electric particles, while the particles of Bita rays negatively charged and Gama rays are neutral. By radiation, the elements also change their nature, e.g. Radium is an element which radiates constantly and ultimately it gets converted to sead. The radio-activity of an element comes to an end only when the protons and neutrons reach a stage of equilibrium.

5. The atomic bomb

Through the nature of atom and its working principles were fairly known to the scientists, but the actual preparation of the bomb took a considerably long time. It was a long difficult, expensive path and the respective governments took all measures to keep the whole process of development a secret one.

However, the first atomic explosion was created by man on 16 July 1945 at 5.30 a.m. in Almogordo Air Base, a remote corner in the desert of New Mexico. The blast it caused could be felt and seen by people within the 3,00 miles range, and the plate glass windows in Silver city, 100 miles away were shattered. An enormous cloud of dust foam and smoke went up as high as 40,000 ft in the air and obscured the scene of ghastly destruction created by the best intelligentia of human race. The awesome roar and terrific lighting effects it created beggar description.

Hiroshima

On August 6, 1945, man used for the first time in human history the atomic bomb against man—a B. 29 bomber plane flying at a very high altitude threw the bomb on Hiroshima, a Japanese town. It is estimated that it had more power than 20,000 tons of TNT and 2,000 times blast power of the then known most powerful bomb—the Grand Slam.

Out of 343,000 population of Hiroshima, 200,000 were killed by the single atomic bomb—and it was not possible to distinguish between men and women killed by the fire, four and half square miles of the city were completely pulverized. This estimate of damage and casuality was based solely on visible havoc and did not include the hazards and destruction it had caused indirectly by radiation.

Only three days later, blood thirsty men once again dropped another bomb on Nagasaki, an industrial town of Japan, causing still greater havoc.

Anyway, these two bombs hastened the end of the Second World War.

6. Race for Power

At the end of the Second World War, it was obvious that might of a country then depended on the atomic power it possessed. Though Germany was the cradle of the atomic scientists, but for the fanaticism of Hitler, she could not enjoy the fruit of it, while USA became the virtual master of the world only allowing a refuge to the externed scientists.

Other countries also did not sit quietly. A group of scientists under the leadership of Kapitsa, Joffa, Chopin and Krichanovosky also developed in USSR, who exploded another atomic bomb sometimes in August, 1947 ; and the Russians claimed that the explosive of that Russian Atomic Bomb was six times greater than the bomb dropped in Hiroshima.

The race for power between the states still continued and against the will of all sensible men and prayer of responsible leaders of men like Bertrand Russel, Sarvapalli Radhakrishnan, power lusting men have still continuing the race for creating this most effective weapon of destruction. By the end of 1955, USA alone exploded more than 40 atomic bombs ; the number of bombs blasted by Russians is not known. Recently Peoples China has also exploded two bombs in 1964 at some place of Siberia.

7. Power—More Power

There is no limit of desire, no end of lusture. Since the end of the Second World War, best brains of mankind are in intense struggle to develop more powerful weapons for destruction. Curiously enough, people have succeeded in achieving their goal—a lot of new weapons have already been developed.

8. The Hydrogen Bomb

On 2 November, 1952, American scientists blasted a bomb at Eniwetok in the Pacific Ocean. That bomb was equally, if not more, destructive as atomic bomb, but the basic scientific principle and material of its construction was different. This bomb was made of Hydrogen, and as such called Hydrogen Bomb.

USSR gave her replies to USA on August, 1953 by exploding her first Hydrogen Bomb. Uptill then the exploding bombs were kept stationary at the place of explosion. Russians were first to overcome the difficulties of dropping the bombs from the aeroplane and thus they bet USA.

The basic principle of atomic bomb is fission of atom, but the Hydrogen bomb obtain its energy from the fusion of the neucleus of light Hydrogen with that of heavy Hydrogen atom.

There is only one electron and one proton in the nucleus of Hydrogen. But there are two isotopes of Hydrogen—Deuterium (H-2/1) and Tritium (H-3/1).

If Deuterium atoms are bombarded with neutron, Tritium isotope is obtained. The fusion of Deuterium atom with Tritium atom evolves infinite energy. Actually when one atom of Deuterium combines with one atom of Tritium, 17·6 Mega-Electron-Volts energy is evolved. Similar amount of energy is also evolved if 2 similar atoms of Hydrogen isotopes combine. This infinite energy actually causes the explosion of Hydrogen bomb. Deuterium and Tritium atoms are fused to make the Hydrogen bomb. But to cause these atoms fuse is not so easy.

When two pieces of U_{235} are mechanically combined together, a chain of reactions start resulting into a tremendous explosions, which emits more than ten thousand degree centigrade of heat. This heat causes the fusion of Deuterium nuclei with Tritium nuclei. The energy evolved by this thermonuclear reaction is usually more than thousand times than the energy is created by exploding a atomic bomb and the power of destruction of a Hydrogen bomb happens to be ten times more than the atomic bomb.

However, the bomb scientists consider the Hydrogen bomb to be uneconomical for the following reasons. It involves energising the projectiles—which is a very costly affair. Secondly, a very little of the released energised projectiles are utilized for the fusion of atoms. Finally, the amount of energy obtained is extremely small compared to the energy actually required for energising the projectiles i.e bombarding particles.

9. Megaton Bomb

Next in the series is Megaton Bomb. It involves fission and fusion both. In it initially fission takes place in U_{235} and thus intense heat is generated. Under this heat Deuterium combines with Tritium resulting very hard neutron particles. The impact of these neutrons causes further fission of U_{235} resulting release of huge quantities of energy. The quantities of released energy may be compared with the energy created by the explosion of 20 million tons of TNT.

Explosion of a megaton bomb causes $8{\cdot}2 \times 10^{14}$ curi radiation per minute and thus within 20 seconds of explosion, all living objects within a radius of 10 Kilometers become fatally radioactive. These radio-active particles spread out all over the world and thus carry the danger far away from the point of explosion.

Russians have exploded a 0 megaton bomb.

10. Nuclear Hazards

Immediately on explosion of a nuclear bomb the following effects will be noticed :—

(a) Creation of brilliant flash, causing temporary or permanent blindness,

(b) generation of excessive heat, resulting burning and melting of all objects near the point of explosion,

(c) terrific blast effecting devastation of all buildings.

Besides these, the burst of a nuclear bomb gives rise to intense radio-activity. For this radio-activity there will be radiation for a long time and radio-active fission products will originate. The type of radio-active fall out differs with the power and place of explosion, and the rate and quantities of deposition depends on whether the bomb exploded in air, in ground or in water. Whatever the place of explosion and however may be the intensity of explosion, the later damages caused by the explosion of nuclear bomb are of tremendous magnitude.

Of all the radio-active fall outs, strontium 90 is the most dangerous. It is brought down to earth by rains. From the soil it passes to the plants along with other materials, sometimes leaves directly intakes this radio-active substance during rains. From the plants this go to the various animals and ultimately to human body and cause severe injuries to them. A few of the harmful effects of intake of radio-active materials into human body are mentioned here—(a) premature aging, (b) occurence of bone/blood cancer, (c) nervous disorder, (d) damage to the immediate offsprings.

It has also been observed that due to atomic radiation, animals lost the reproductive capacity.

11. Protection

As the effects are broadly of two nature—immediate and late, protective measures are also mainly of types.

Protection from immediate effects

(i) To be far away from the point of explosion.

(ii) To remain behind an opaque cover, which may partially protect one from the intense light.

(iii) To cover the body by suitably designed heat-proof clothing. This clothing must be pale, light and multilayered.

(iv) To wear gas masks.

All these steps suggested are of theoretical importance, as practically common people of any country cannot afford to bear the cost for radiation proof clothing or gas masks. And in any case no body can guess when and where the nuclear bomb will be dropped.

Protection from late effects

(i) Areas of heavy contamination must be earmarked and made out of bounds for all people.

(ii) Evacution of people to non-effective areas.

(iii) Exposed parts must be thoroughly cleaned.

(iv) All food stuff must be coverd by fine filtering equipments.

(v) People working near the places of heavy contamination must wear thermal radiation proof clothings and they must be checked periodically by a medical board.

12. Guided Missiles

Due to the race of discovery and development of deadlier weapons during the post war phase the world has already witnessed terror weapons like rockets, robots, guided missiles and ultimately the Inter Continental Ballistic Missile (ICBM), which is believed to be capable of hitting any target on the globe and consigning that area to the oblivion of history.

All guided missiles can find the target and destroy the same. There are four types of guided missiles, which come under the purview of military studies. These are mentioned below :—

(a) Ground to Air Missile
(b) Ground to Ground „
(c) Air to Air „
(d) Air to Ground „

(a) *Ground to Air Missile* : These are used for destroying the supersonic bombers of the enemy.

(b) *Ground to Ground Missile* : These include ICBM and may replace the present day long-range artillery. Discovery of ICBM has killed the idea of immunity from military operations and dangers on account of remoteness, as the range of ICBM can be upto a few thousand miles.

(c) *Air to Air missile* : Thuse are mostly used by fighter plans to destroy the supersonic bombers of enemy. They are small in size and their range are also limited.

(d) *Air to Ground Missile* : These are dropped from planes to destroy enemy air-port, places of strategic importance, enemy vessels, tanks, artillery, etc. Their range can be upto a few hundred miles.

The operaton of guided missile has the following stages—firing this weapon, following their flight, controlling them. At the same time arrangements must be made for protection from enemy attack at the firing pad.

Usually every guided missile carrys a fuse at its tip. Just below the fuse remains war-head ; the fuse is set up in such a manner that it can explode to war-head at the desired time. Behind the war-head is the main air-frame of the rocket instrument and bulk head. These are the parts required for the offensive action by the missile. Besides these, there are parts for the propulsion system, these are—alcohol tank, cylindrical centre section, oxygen tank with alcohol pipe in the centre, hydrogen-peroxide tank, turbo pump, pressure flasks, injection head and combustion chamber. Behind this propulsion system is the guidance system, which is composed of fins, internal graphite veins and external veins. At the end is the control system. The rockets can be controlled in the flight through radio-navigation, with the help of ballistic trajectory or through the Celestial Navigation.

19

ORGANIZATION OF INDIAN ARMY

1 Introduction

The Indian Army is an elaborate organization with much complicated fabrications like all other standard Armies of the world. It is not possible to describe the organization of this vast machinery in details here. Only the very essential features have been enumerated below.

During the British regime the *Commander-in-chief* of the Indian Army was not only the Supreme Commander or Head of the three services, he was also the *War Member* of the *Executive Council* of the *Viceroy and Governor General.* As such the Commander-in-chief had a special privileged position. But since India has become a republic the conditions have changed basically. Now *President of India* is the *Supreme commander* of all the *Armed Forces* of the Indian Republic ; and he is advised for all purpose by the *Ministry of Defence.*

The *Ministry of Defence* now is the central agency for formulating the defence policies and to implement those policies through the three *Defence Service Headquarters* (Army HQ, Navy HQ and Air Force HQ) after obtaining due permission from the Government of India.

Each service has been placed under separate and independent executive heads and their present designations are *Chief of the Army staff*, *Chief of the Naval staff* and *Chief of the Air staff.* To co-ordinate the needs and activities of the three services a mesh of committees has been established at different levels, the most important of which is *Defene Committee of the Cabinet.* This committee is presided over by the *Prime Minister* of India.

The Indian Army is commanded by its *Supreme Executive, the Chief of the Army staff*, who holds the rank of General.

2. The Army Headquarters

The General has under his direct control the ***Army Headquarters***, which is located at New Delhi. The Army Headquarters is divided into several branches, *viz.* (1) ***Adjutant General's branch.*** (2) ***Quartermaster General's branch***, (3) ***Master General of Ordance branch***, (4) ***Engineer-in-chief's branch***, and (5) ***Military Secretary's branch.*** All these branches are commanded by Major Generals and each branch is further subdivided into various directorates—responsible for various works.

3. The Chain of Command

Indian Army is divided into *Static Formations* on the geographical basis and *Field Formations*—for the operational purpose.

STATIC FORMATIONS

India has been divided into four regional commands for the purpose of command and administration during peace time. The commands are : (1) Southern command. (2) Western command. (3) Eastern command, and (4) Central command. Each of these commands are in direct control of a *General Officer Commanding-in-Chief* (GOC-in-C) who holds the rank of Lieutenant General. These commands are based on geographical basis and are called *Static commands.*

Each of these commands is composed of several *Areas.* One Area may be constituted of one state or of several states. Areas are commanded by General Officer Commander (GOC), who is a Major General by rank.

An Area is further divided into several, usually three, ***Sub-areas.*** A Sub-area may constitute one city or a part of a state, depending upon the importance of the particular place. Sub-areas are commanded by Brigadiers, who are called Sub-Area Commander.

Each Sub-area is composed of few ***Stations.*** Stations are usually cities, cantonments or parts thereof. Stations are commanded by the senior-most officer present there. Customarily, a station is commanded by a Colonel.

From a Station commander to an Area commander everybody is responsible for admininstration of all troops located in their particular zones. These troops are called *Lodger formations.*

FIELD FORMATIONS

The formations in which an army goes to operation are termed *Field Formations.*

The highest Field formation is the *Army* or a *Army group*, consisting of some armies. This is commanded normally by a Lieutenant General or a General or even by a Field Marshall.

An Army is usually composed of three *Corps* but may have more Corps in addition to a number of *Armoured Division* and *Air Force* detachments under command or in support. Normally Corps is commanded by a Lieutenant General.

One point must be mentioned here that the *Corps* means, when used to an *administrative organization*, a group of personnel with common task. training and characteristics ; but when this term refers to a *tactical organization*, it means a formation usally consisting of three *Divisions.*

A *Division* is a permanent tactical formation, capable of independent operations and nomally is commanded by a Major General. *Divisions* may be of several types *e. g.*, Infantry, Armoured, Airborne, etc. An *Infantry Division* normally has three *Brigades* in it, besides all other arms and services. Usually a Division is an elaborate organization constituting of all arms and services of Army.

A *Brigade is* commanded by a Brigadier and is composed of three *Infantry Battalions.*

Battalions are regarded as *units* of formations. A *Battalion* is commanded by a Lieutenant Colonel.

20

ORGANIZATION OF BATTALION

1. Introduction

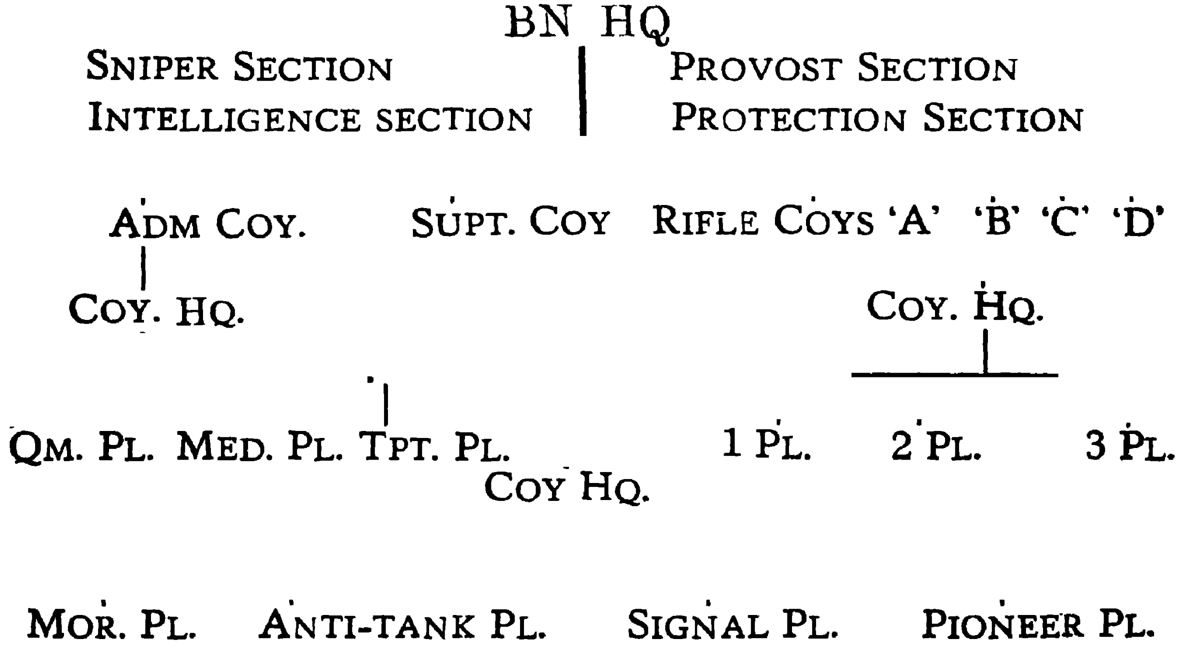
An infantry battalion is a unit capable of destroying enemy or capturing a place with or without support of other arms services. An infantry battalion is a self-administered body.

A infantry battalion is so organized that the maximum offensive potentialities and fire power can be brought to exercise at any time without causing any trouble in the administration. For this purpose an infantry battalion has four '*Rifle companies*', To provide support with greater volume of fire and also with signals to the Rifle companies another company, the '*Support company*', has been organized ; and for proper administration of all elements there is another company, the '*Administrative company*'. To control and command all these companies there is a central organization, the '*Battalion Headquarters*'.

But a training unit *e.g.*, a NCC Battalion, is essentially different in spirit and structure. Care is taken there to ensure that maximum possible number of cadets can be kept free for training.

The organization of the battalion changes from time to time for many reasons.

2. Structure of a standard infantry battalion



There are 16 Officers, 25 J.C.Os., 857 Other ranker (OR.), and 48 Non-Combatants Enrolled (N.Cs.E.) in a standard infantry battalion. Besides these, some other persons are also attached usually with standard battalion. They are as follows :

a)	Medical Officer (Capt. of Army Medical Corps)		1
b)	Education J.C.O.		1
c)	Education Havilder		6
d)	Electric and Mechanical Engineer's personel		6
	Hav. Armourer	1	
	Sepoy Armourer	1	
	Fitter	1	
	Vehicle mechanics	4	
e)	Electricians		2

3. Structure and function of different sub-units

(A) BN. HQ. (Offrs—5, J.C.Os—3, OR.—53).

OFFRS.	J.C.OS.	OR.	
C.O.—Lt./Col.	Sub. Major	Battalion Havildar Major (BHM)	1
2 i/c—Maj.	Jem. Adjt.	Int. Sec.	1 & 6
Adjt—Capt.	Head Clerk—Sub./Jem.	Sniper Sec.	1 & 8
Intelligence Officer—Lieut.		Provost Sec.	1 & 6
Spare Officer—Lieut.		Protection Section	1 & 10
		Hav. Clerk	2
		Nk. Clerk	1
		Sep. Clerk	1
		Batman	9
		Orderly	5

Functions

The battalion headquarters is the controlling centre of all activities of the unit. In mobile operations this is once again divided into two parts ; tactical and main headquarters. The tactical part consists of the Commanding Officer, Intelligence Officer, Signal operators and Despatch riders. This part controls the operation and always remains far ahead of the rest of the unit. The main headquarters, under the command of Second-in-Command remains at the rear of the unit and maintains the general administration of the unit.

The Commanding Officer : He is responsible for everything of the battalion—its efficiency, administratjon and training. He makes the general policy and gets all the points executed precisely in details through his subordinates. He is directly assisted by his staff officers—the Adjutant, the Quarter Master, the intelligence Officer and the Medical Officer.

The Second-in-Command : He must always be ready to take over the command of the unit when the C. O. is absent from the unit or becomes a casualty. For this reason he must always keep himself in intimate touch with everything happening in the battalion. He is specially responsible for the accounts, welfare and training of officers and men. He commands all officers, excepting C.O., in the unit.

Adjutant : He is the principal staff officer and is the backbone of the unit. He is responsible to the C.O. and assists the C.O. in general duties, administration and training. Actually he co-ordinates all activities of the unit. This is his great responsibility. He performs all works on behalf of the C.O., but the post commands no seniority over other officers.

Intelligence Officer : He is actually the eyes and ears of the C.O. His primary duties include collection of all news and information regarding enemy, terrain and weather. He is also responsible for planning and operating counter espionage. He commands the intelligence section. He may also command the sniper section.

The Spare Officer : He is usually a young officer and has got no specific responsibility. He is to perform the duties as assigned.

The Subedar Major : He is the senior most J.C.O. in the unit. He is responsible for discipline, welfare, training of the men. His special responsibility is the accounts and treasury of the unit.

The Jemadar Adjutant : He is assistant to the Adjutant. He helps the latter in all his duties.

(B) ADM. COY [Offrs.—3, J.C.Os.—2, OR.—144, N. Cs. E.—48]

(*i*) COY HQ. [Offr.—1, J.C.O.—0., OR.—7]

OFFR.	OR.
Coy Comdr.—Capt.	Company Havildar Major (CHM.)— 1
	Company Quarter Master Havildar (CQMH) —1
	Sep. Clerk—1
	Pay Naik— 1
	Storeman— 1
	Batman — 1
	Orderly— 1

Functions

The administrative company is mainly meant for smooth functioning of the unit. The specific responsibilities of the company are—food, ammunition, clothing, accommodation, medical cover and transport.

This company plans and prepares the accommodation, food, stores and dresses. If the unit moves from one place to other, this company does the preliminary work and also completes the last part of the job of winding the establishment. This company is also responsible for the sanitation and first aid, and also for making arrangements with hospitals.

(*ii*) QM. PLATOON [Offr.—1, J.C.O.—1, OR.—55, N.Cs.E—48]

OFFR.
Quarter Master—Capt.

J.C.O.
Jem. Q.M.

OR.
Battalion Quarter Master Havildar (BQMH)— 1
Ammunition Nk 2
Clerk (Hav)— 1
Clerk (Nk)— 1
Clerk (Sep)— 2
Mess Hav— 1
Cook (Hav) 1
Cook (Nk)— 1
Cook (L-Nk) —2
Cook— 17
Eqpt. and Boot repairer— 5
Tailor— 2
Postman— 1
Blacksmith— 1
Carpenter— 4
Batman— 2
Orderly— 1
Storeman— 2
General duties—8

N.Cs.E.
Sweeper— 18
Barber— 12
Washerman— 12
Officers' Mess Servants :
Cook special Grade I— 1
Cook mess Grade II— 1
Masalchi— 1
Waiter Mess Grade III– 2
Waiter Wine Grade II— 1

Functions

The Quarter Master's platoon is directly commanded by the Quarter Master and assists the latter to discharge all his duties.

The Quarter Master : He is responsible for (1) allottment of accommodation, (2) indenting, receipt, catering, accounting and inspection of all ordnance stores, *e.g.*, arms, ammunition, weapons, equipment and rations, (3) maintenance of stores, (4) canteen and other shops of the unit—cleanliness and wholesomeness of food, (5) workshops of carpenters, cobblers, tailors and armourer's.

(iii) MED. PLATOON [Offr.—1 (att), J.C.O,—0, OR.—21]

OFFR,	OR.	
Medical Offr.—Capt. (AMC-att.)	Hav. strecher bearer—	1
	Sanitory duties orderly (Nk)—	1
	Water duties orderly—	1
	MO's orderly—	1
	Strecher bearer—	16
	Batman —	1

Functions

This platoon is responsible for giving the medical cover to the unit, and is commanded by the Medical Officer, who is an attached person. The platoon assists him in performing all functions.

The Medical Officer : He is responsible to the C.O. for advising him on all hygienic and preventive points. He will certify that water available in the locality is drinking water ; if he is not satisfied with the condition of water he is to put suggestions for improving the standard of water. He is also responsible for first aid to the casualties. For this reason, he prepares a Regimental Aid Post (R. A. P.).

(iv) TPT. PLATOON [Offr.—1, J.C.O—1, OR.—61]

PL. HQ. (Off.—1, J.C O.——, OR.—6)

Offr.— 1	M.T.O. Capt.	
J.C,O—1	Pl 2 i/c—Sub.	
OR.— 6	Tpt. Hav.—	1
	Clerk (Nk)—	1
	Storeman MT Store—	1
	Storeman POL—	I
	Batman—	2

1 Sec.	2 Sec.	3 Sce.
Sec. Comdr—Nk.	Sec. Comdr.—Nk.	Sec. Comdr.—Nk.
Drivers—4	Drivers—18	Drivers—90

Functions

This platoon provides the unit with mechanical transport and is responsible for cleanliness and proper maintenance of the vehicles. This platoon is commanded by the Mechanical Transport Officer (M.T.O.)

The Mechanical Transport Officer: He is responsible for the vehicles and patrols, oils, etc, required for the vehicles. He will distribute the vehicles to the peoples of the unit on demand for official business and will maintain record of mileage run by each vehicle, so that, vehicles can be send to the workshop in proper time.

(C) SUPPORT COY [Offr—4, J.C.Os.--4, OR. – 132]

(*i*) Coy Hq. (Offr. – 1, J.C.O. – 0, OR. – 8)

Offr.	OR.
Coy Comdr – Maj.	C. H. M.
	C. Q. M. H.
	Clerk (Nk)
	Clerk (Sepoy)
	Pay Naik
	Batman
	Storeman
	Orderly

Functions

The basic responsibility of the Support Company is to provide fire support to the assault elements *i.e.*, Rifle companies of the unit. The Company consists of four specialized platoons meant for different functions. The company headquarters controls the platoons.

(*ii*) Mortar Platoon [Offr. – I, J.C.O. – I, OR. – 33]

Pl. HQ.

Offr.— I Pl. Comdr. – Capt.
J.C.O. – I Pl. 2 i/c. – Jem.
OR. – 3 Ammunition Naik – I
Batman— 2

I Sec. 2 Sec. 3 Sec.

Each section consists of I+9 ORs as per following ;

Sec. Comdr. –	Hav.
Sec. 2 i/c	L/Hav.
Sec. Naik –	I
Wireless operator –	I
Mortarman –	6

Functions

This platoon is the artillery of the unit, as it possesses six 3″ mortars. The platoon is divided into three sections, each section having two mortars. The platoon is commanded by an officer, who is responsible for operation of the mortars according to the desire of the C.O.

(*iii*) Anti-tank Platoon [Offr. – I, J.C.O. – I, OR. – 33]

Pl. Hq.

Offr. – I Pl. Comdr. – Capt.
J.C.O. – I Pl. 2 i/c. – Sub.
OR. – 3 Ammunition Naik – I
Batman— 2

I Det. 2 Det. 3 Det. 4 Det. 5 Det. 6 Det.

Each detachment consists of 5 soldiers as per follows :

Detachment Comdr. –	Hav.
Detachment 2 i/c. –	Naik.
Gunner –	3

Functions

This platoon is equipped with six 6-pounder anti-tank guns. This provides support to the unit against tank attack.

(*iv*) Signal Platoon [Offr. – 1 J.C.O. – 1, OR. – 36]
Offr. – I Pl. Comdr. – Capt./LT.
PL. Hq. J.C.O. – I Pl. 2 i/c – Sub.
OR. – 7 Pl. Hav.
Storeman Naik
Batman—3
Orderly – 3

Wireless Sec.
Sec. Comdr. – Naik
Sec. 2 i/c. – L-Naik
Signaller = 16

Line Sec.
Sec. Comdr. – Naik
Sec. 2 i/c. = L-Naik
Signaller
Line duty = 6
Signaller
Exchange duty = 3

Functions

This platoon provides inter-communications within the unit and also with other units. On the quick and proper functioning of this platoon depends the efficiency of the whole unit.

(*v*) Pioneer Platoon [Offr.. – 0, J.C.O. – I, OR. – 22]
J.C.O – I Pl. Comdr. – Subedar
Pl. Hq. OR. – 2 Pl. 2 i/c Havildar
Batman = I

1 ASLT. SEC.	2 ASLT. SEC.	PNR. SEC.
Sec. Comdr.—Naik	Sec. Comdr.—Naik	Sec. Comdr.—Naik
Sepoy—3	Sepoy—3	Sepoy—11

Functions

The platoon is the engineering component of the unit. It carries out all tasks, of course, not big enough, in the engineering line, specially in the fronts, where the advance of the unit can not be halted. It clears the mines laid by the enemy. It also prepares traps for the enemy.

(D) RIFLE COY [Offr.—1, J.C.Os.—4, OR.—132]

COY HQ.
Offr. 1, Coy Comdr.— Maj/Capt.
J.C.O.1, Coy 2nd. in Comd.—Sub.
OR.—9, Company Hav. Maj.— 1
Coy Quart. Master Hav.—1
Sepoy Clerk— 1
Pay Naik— 1
Storeman— 1
Batman— 2
Orderly— 2

1PL. 2PL. 3PL.

Functions

There are four Rifle companies in each unit. They are the attacking component of the unit. Each company is commanded by a Company Commander, who is responsible to the C.O. for operations, welfare, and training of the company. Each Rifle company has one company headquarters and three platoons. The company headquarters is the controlling organization whereas the platoons are fighting ones.

Each platoon has a platoon headquarters and three sections. The platoon is commanded by the platoon commander, who is a J.C.O. and sections are commanded by section commanders, who are N.C.Os.

During training period and also in operations the section commanders must keep very close touch with the platoon headquarters, and in turn the platoons must remain in intimate connection with the company headquarters, so that the cohesion in the company remains firm.

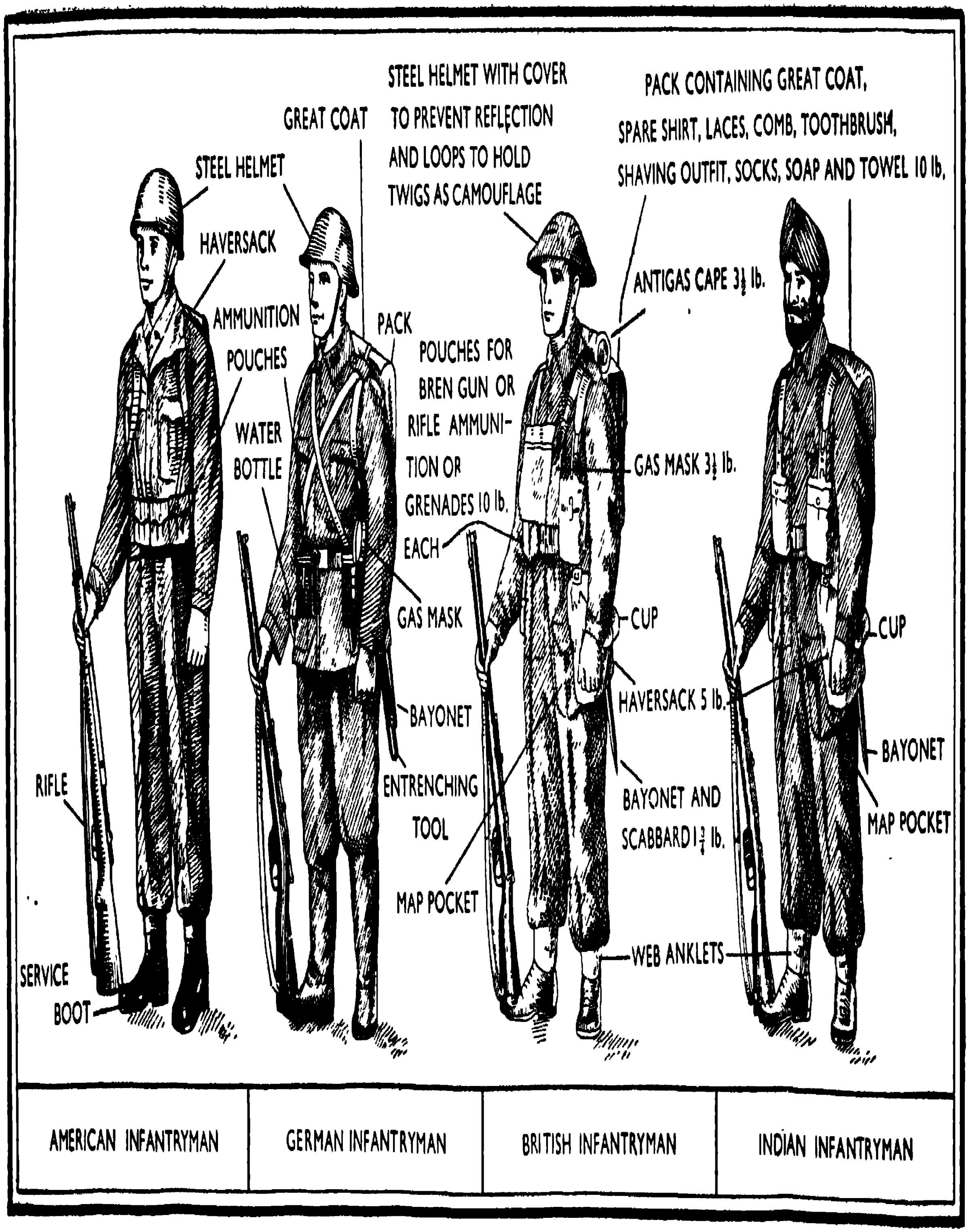
The detail organization and equipment of a platoon and a section is given below. The strength of a Rifle platoon is 0 officer, 1 J.C.O., and 41 other rankers.

Platoon Head-Quarters

APPOINTMENT	RANK	EQUIPMENTS CARRIED
Platoon commander	Sub/Jem.	Pistol or S.M.C. with 5 mags, torch, whistle, binoculars, compass, map, notebook, pencil, wrist watch, pointer staff.

APPOINTMENT	RANK	EQUIPMENTS CARRIED
Platoon Havilder	Havilder	S. M. C. or rifle with 50 rounds ; very light pistol with 12 cartridges.
2″ Mortar detachment Commander	Naik	•38 Pistol with 12rounds or S.M.C. ; six 2″ Mortar H.E. bombs.
Mortarman No. 1.	Sepoy	2″ Mortar ; six 2″ Mor. H.E. bombs, six 2″ Smoke bombs.
Mortarman No. 2.	Sepoy	Rifle with 50 rounds, six 2″ Mortar H. E. bombs, six 2″ Mortar Smoke bombs.
Rocket Launcher det. Comdr.	L/Naik	·38 Pistol with 12 rounds, one Rocket Launcher with 1 ammunition of the same.
Rocket Launcher No. 1	Sepoy	Rifle with 50 Rounds ; two 36 H.E. grenades, one 70/80 grenade, two Rocket Launcher ammunitions.
Two runners	Sepoy	Rifle, bayonet ; two 36 H.E. grenades. Signal pistol (carried by one), Wireless set (carried by other).
Section		
Section Commander	Naik	S. M. C. with 5 magazines ; Wire cutter, notebook, pencil, whistle and map.
Sec. 2nd-in-Comd.	L/Naik	Rifle with 50 rounds, bayonet ; 2 H.E. grenades ; 2 L.M.G. magazines.
Rifleman	Sepoy	Same
Gunner No. 1.	Sepoy	One L.M.G. with 5 magazines, spare parts wallet.
Gunner No. 2.	Sepoy	Rifle with 50 rounds, bayonet ; 4 L.M.G. magazines, spare barrel of L.M.G.

*There are 7 Riflemen in each section of a Rifle Platoon.



AN INDIAN SOLDIER BY THE SIDE OF OTHERS

Fig. 31 : An Indian soldier himself carries all commodities essential for fighting and is self-dependent for his own requirements. He carries all the load above the line of belt keeping himself light-footed for fast and easy movement.

21

INFANTRY SECTION

1. Introduction

A section is the smallest sub-unit in infantry. It is capable of independent fighting, but very rarely it fights independently.

2. Characteristics

A section possesses firepower and is also flexible. It can penetrate through any sort of terrain.

3. Organization

The organization of a section has already been discussed in nutshell in the foregoing chapter. It is commanded by one section commander (Naik). He is assisted by a second in-command (L/Naik). Besides them there are nine other soldiers.

A section is composed of two groups : Rifle or *assault* group and Bren or *support* group. The rifle group is also considered as 'move' group, while the Bren group as 'fire' group. The rifle group consists of 6 riflemen and the Bren group consists of 2 men—one gunner No. 1 and the other gunner No. 2, who is actually a rifle man. The rifle group always provides scouts for the section.

The section commander forms part of NO group but usually moves with the rifle group and the second-in-command is in charge of the Bren group. But the section commander holds the responsibility of the total section and any part thereof.

Normally a section works by groups *i.e.*, when the Bren group is producing fire, the rifle group advances and as the rifle group starts action the Bren group stops fire.

To make a section really good the following points must be noted :

a) Team spirit is essential.

b) Every soldier must be able to take up the position of any other soldier, if required.

c) Must have each place filled by the suitable man and each weapon handled.

22

SECTION FORMATIONS

1. Introduction

Whether the section is looking for enemy or going to kill enemy or moving for some other purpose, the commander of the same must organize the troop in such a way so that he can extract the best fire power from the troop instantaneously.

As the situations are not always the same nor the ground, the commander must be capable of organizing the section in that formation which may suit the ground and the situation best.

2. Different formations

The five main formations are explained below with their advantages and disadvantages.

FORMATION	ADVANTAGE	DISADVANTAGES
(A) *Single file*: When all the men form one longitudinal line, *i.e.* one man is covered by the rest.	(*i*) Good control and speed. (*ii*) Useful for certain type of cover *e.g.* hedges. (*iii*) Capable of rapid production of fire to flank.	(*i*) Bad for fire production to the front or to the rear. (*ii*) Vulnerable to front or rear attack.
(B) *Loose file*: Normal file formation, but staggered so that men are NOT covered.	(*i*) Good control. (*ii*) Rapid movement. (*iii*) Easy to change the line of advance.	(*i*) Vulnerable. (*ii*) Incapable of quick fire production at any side.

FORMATION	ADVANTAGES	DISADVANTAGES
(C) *Extended line or Assault formation* : When all the men come in one horizontal line to extend the face of the section.	(*i*) Best for final assault. (*ii*) Very good for crossing gaps or open ground under frontal attack. (*iii*) Capable of rapid production of fire to front or rear.	(*i*) Control becomes difficult. (*ii*) Easily vulnerable to flanking attack.
(D) *Irregular arrowhead :* Normal arrowhead formation but staggered so as to avoid regular pattern visible from air.	(*i*) Easy deployment to either flank. (*ii*) Good for production of effective fire. (*iii*) Used on open ground and also while moving through scrub or wood.	(*i*) Control is difficult.
(E) *Diamond or Box formation* : When people are so arranged that they form an outline of a diamond or box.	(*i*) It provides all-round observation. (*ii*) It helps in all-round defence. (*iii*) Usually used in race patrol, hence it is known as 'Patrol formation'.	(*i*) Slow movement.

3. Factors to be considered before employing any formation

A section commander must consider the following factors before he decides on which formation to use :

(*a*) Type of ground,
(*b*) Enemy's fire,
(*c*) Direction and volume of own fire,
(*d*) Control,
(*e*) Speed.

At times the factors may appear as conflicting ; then the section commander must utilize his discretion to get the maximum result on the desired direction, *i.e.*, he must be very clear in his mind regarding the aim—speed or volume of fire or something else ; and according to that he will select the type of formation.

During an advance a section commander may have to change the formation to suit the ground and the situation. It is NOT must for him to adhere strictly to any formation but should always adjust the formation as the situation demands.

4. A few points to be noted

(*a*) There is no hard and fast rule regarding the place of a section commander in any formation. The only essential point is that he will place himself wherefrom he can best lead and control the section.

(*b*) In all formations intervals between men, excepting night and foggy days, should be about five yards. During nights and foggy days the interval must be reduced to ensure control and cohesion.

(*c*) Men of a section should be so placed that an all-round observation is always maintained.

(*d*) Place of Bren group depends on the discretion of the section commander.

23

FIELDCRAFT

1. Introduction

Fieldcraft is the art of utilizing the ground with all features—natural and artificial, on it under all conditions to the best advantage of movement and employment of weapon.

Fieldcraft is a natural instinct of wild animals and also of tribal peoples living in jungles. But for the civilized people this art is to be learned.

2. Object

(*a*) To go very close to the enemy unnoticed and unheard, or to guide the enemy to the trap.

(*b*) To move away to safe area unseen by enemy.

3. Ingredients

To be good in fieldcraft a man must have the following qualities :

(*a*) The capacity to study any ground so that the best possible advantages from the ground can be achieved.

(*b*) The ability to improve the cover for the benefit of own troop and to improve the obstacles for enemy.

(*c*) Intelligence.

(*d*) Physical fitness to ensure speedy, silent, steady movement and also to be able to withstand the hazards.

(*e*) Mental strength, so that one can stand the impact of the close quarter battle.

(*f*) Sound knowledge of weapons, so that one can decide instantaneously which weapon will be of best advantage under which circumstances and on which ground.

(*g*) Discipline *i.e.*, the jubiliant mental condition to obey any order without hesitation.

4. A few points to be noted

(*a*) *Fieldcraft is universal.* To go to the close of enemy in any sort of terrain one must be efficient in fieldcraft. Battle may take place in open flat country, in town, in mountains, in jungles, in snow or also in desert. So one must be trained to squeeze out the best possible advantages from all types of ground.

The ground does not mean the general shape and pattern of the area but every little undulation and fold, trees and bush, ditch or cutting, culvert or bridge, foot track or road, building or any structure in the area should be given due consideration.

(*b*) *Fieldcraft is collective in nature.* It is true that every individual soldier should be efficient in fieldcraft but unless all of them know how to move and work as a well-knitted team the training will be of no use. So every individual should know how to take his place in the team.

(*c*) *Fieldcraft is mainly offensive.* The spirit of fieldcraft is aggressive. Whether you go away of enemy's reach, the spirit is to devastate the enemy or his plan.

(*d*) *Fieldcraft demands strong observation and quick movement.*

24

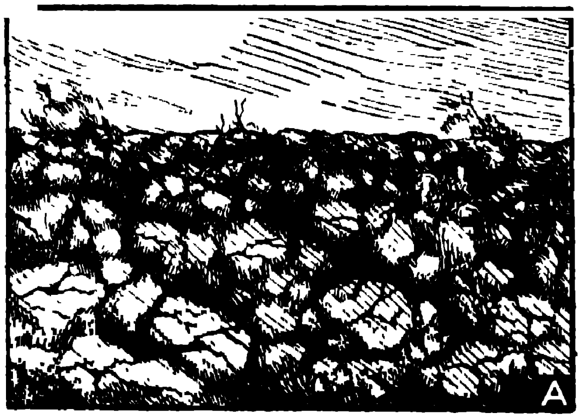
GROUND

1. Introduction

On the earth's crust there are various types of grounds. All these types of grounds can broadly be grouped under seven heads. Each of this group has its own particular advantages and disadvantages.

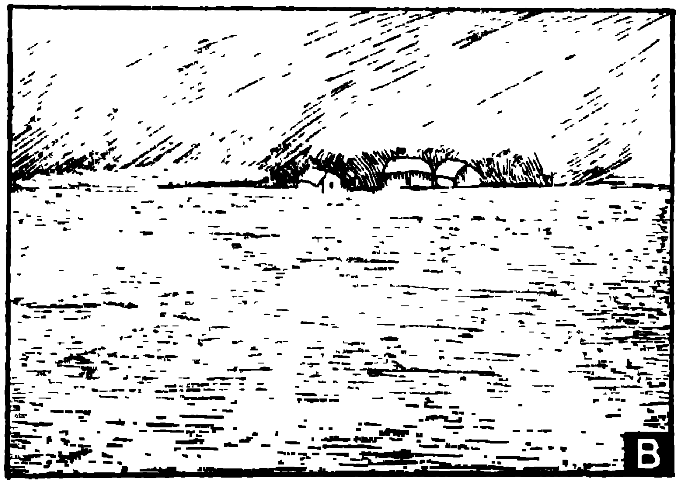
2. ypes of grounds and their characters

A. Broken ground : Uneven in nature, it includes area which is not smooth. It affords good protection from enemy's view and fire (excepting from the air). But it hinders good observation of enemy activities and also will not allow quick movement.



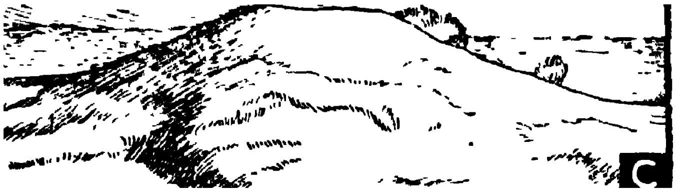
BROKEN GROUND
Fig. 32

B. Flat and open ground : Spread out ground without having any obstacle of view. It allows quick movement and observation, at the same time exposes one completely.



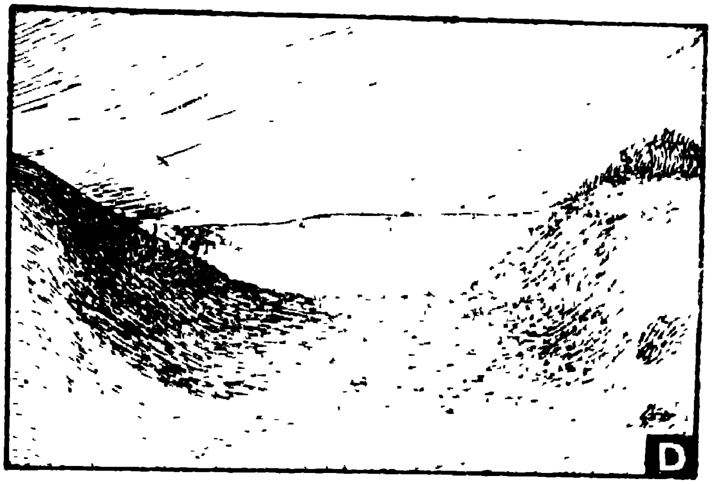
FLAT AND OPEN GROUND
Fig. 33.

C. High ground : An area which is at a higher level in comparison to the surroundings. It allows good observation and frequently good fields of fire. But it is very easily detected by enemy and is not good in defence unless neighbouring high grounds are also occupied by own troop.



HIGH GROUND
Fig. 34

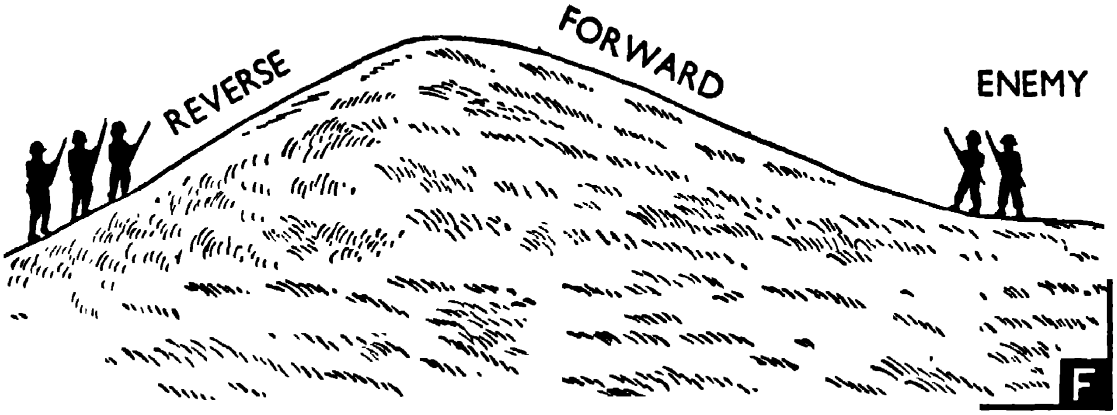
D. Low ground : An area which is comparatively at a lower level than the surroundings but not deep. It may be good to hide oneself from the enemy's view and at times from fire also, but it does not allow good observation to the self or employment of own weapons.



LOW GROUND
Fig. 35

E. Dead ground : An area which the firer cannot see from his position. It gives goodp rotection from enemy's view but not always from enemy's fire. It also hinders ones' own observation and movement. A dead ground must always be avoided.

Fig. 36 : DEAD GROUND



FORWARD AND REVERSE SLOPES
Fig. 37

F. Forward slope : The slope of the hill which faces the enemy. It is good for observation and employment of weapons, but it is difficult to conceal a position in a forward slope from enemy's view and fire.

G. Reverse slope : The slope of the hill which faces own troop. It is concealed from the ground observation of enemy hence also from direct fire of enemy, and if intelligently utilized, affords a good protection at the same time surprise may also be caused.

3. Important featurers of the grounds which require proper attention :

(*a*) Undulations and folds,
(*b*) Drains, cuttings,
(*c*) Culverts and bridges,
(*d*) Trees, shrubs, herbs, bushes,
(*e*) Roads and tracks,
(*f*) Ponds, ditches,
(*g*) Defile,
(*h*) Spur,
(*i*) Re-entrant,
(*j*) Slopes—forward and reverse.

4. Points to be noted

(*a*) Observe the ground carefully from one border to the other.
(*b*) Search for the enemy.
(*c*) Locate the enemy.
(*d*) Judge the distance.

(*e*) Decide how the enemy can utilize the ground for offensive and defensive purposes.

(*f*) Utilize the ground, so that it assists you.

(*g*) Remember always, as you are trying to get advantage of the ground, enemy is also equally busy in doing so ; remember your enemy is more intelligent than you.

25

DESCRIPTION OF GROUND

1. Introduction

People may describe a ground in various ways, so to avoid confusion a standardized method for quick and accurate description of the ground has been laid down.

2. Method

(*a*) The sub-unit commander should arrange the sub-unit in an arc and he himself should go at the centre and rear. Then he tells the general line of direction (Hindi—Amrukh) to the sub-unit. This is done by the aid of a prominent landmark which is situated in the general line of direction at a great distance. In describing the general line of direction one should shout first the name of the sub-unit, then the distance—if the distance cannot be calculated, simply say distance.

Specimen :—"No. 1 Sec.—Look front (Samne-dekh)—600—Lonely tree (Akeli darakht)—The line running from the centre of the section through the lonely tree to the distance is the general line of direction of the section (Section ki bichse wo darakht hote hue dur tak jo line hoti hai wo section ki amrukh)."

(*b*) After deciding the general line of approach the boundaries should be indicated. First indicate the left boundary and then the right one. This is usually done by utilizing two or more important landmarks on each boundary ; but if required only one feature may also be used. Here also shout first the name of the sub-unit, then the distance, next the direction and then the landmark.

Specimen :—"No. 1 sec —300—Half left (Andha Bayen)—Wall (Diwar)—600—Half left (Andha Bayen)—Bridge (Pul)—The line joining the left side of the leftmost man of the section, the right edge of the wall and the right edge of the bridge is the left boundary of the section (Pul ki dahine kinarse dewarki dahine kinara hote hue section ki sabse baenwala jawan ki baen tak section ki baen had)."

When only one feature is used the description will be simpler.

Specimen :—"No. 1 Sec.—300—Half left (Andha Baen)—Wall (Diwar)—The line joining the left side of the leftmost man of the section with the right edge of the wall is the left boundary of the section (Diwar ki dahine kinara se section ki baenwala jawan ki baen tak section ki baen had)."

(*c*) The right boundary will also be given in the similar way but care must be taken to see that the landmarks utilized in describing the general line of direction and left boundary are strictly avoided during describing the right boundary. If a tree, wall and a bridge have been used for the previous cases these will NOT be used while the right boundary is being described. Similarly the range of distances and directions must also be avoided—that is, if '300' '600' and half left have been used in the first case these should not be used in the case of the right boundary.

Remember, the range of distances used here are always in terms of yards *i.e.*, 300 means 300 yards. After defining the boundaries the ground will appear as an arc.

When the arc of field has been described the ground is to be divided into three regions : (*i*) fore ground, (*ii*) middle distance or middle ground and, (*iii*) distance. This can easily be done by utilizing the landmarks which were used in describing the arc.

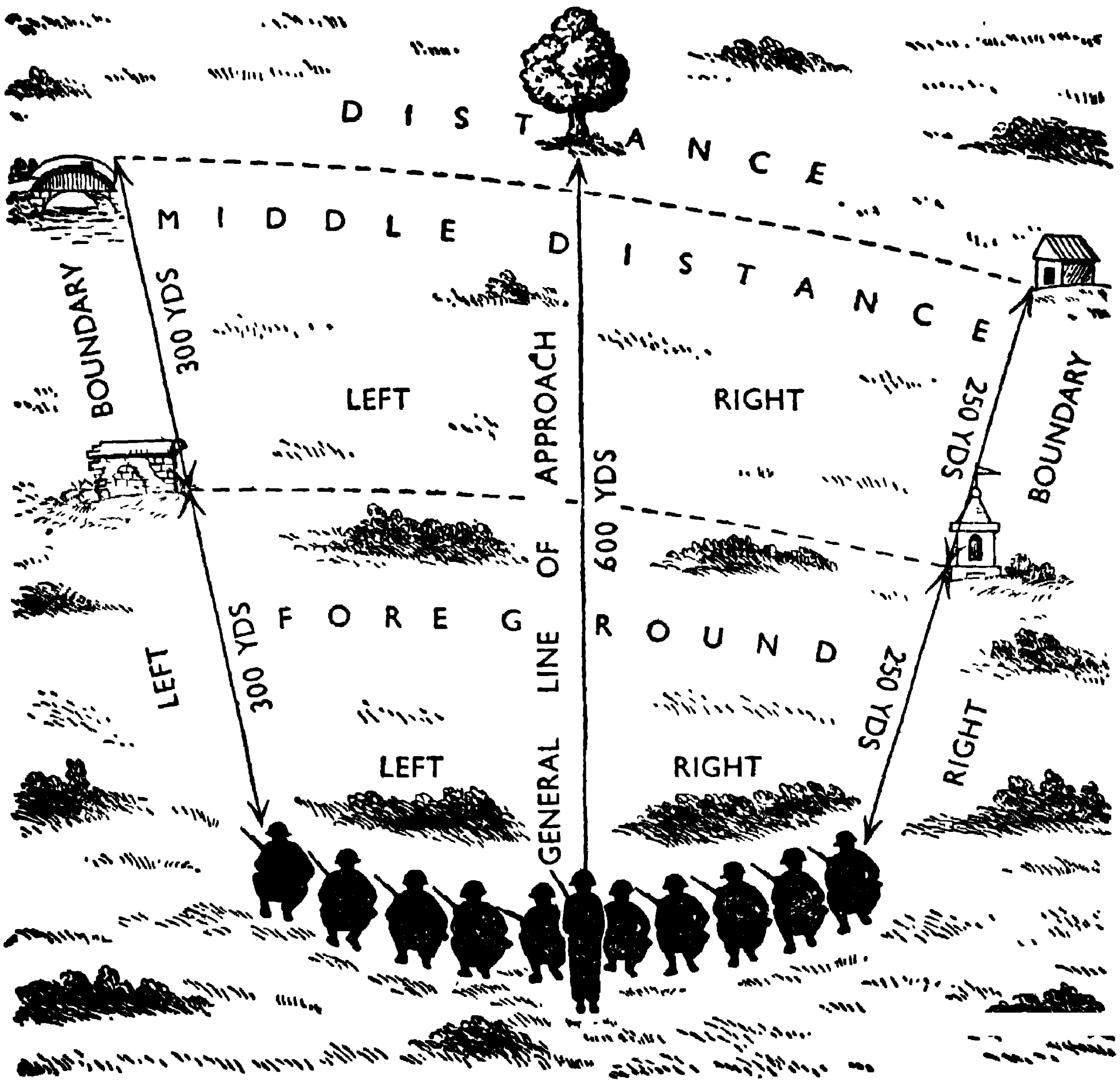
Specimen :—"No. 1 Sec.—The area between the left wall and the right house (a landmark used during describing the right boundary) is the foreground of the section (Baenwala pul se dahine wala mokam ki beechwala jamin section ki foreground)."

In the same way the middle distance and distance can be described.

Usually the area of the ground within the effective range of small arms is regarded as 'Fore ground', the area between the effective range and maximum range (Upto which shots can be aimed) is regarded as 'Middle distance' and the area beyond that is regarded as 'Distance'.

(*d*) When the ground has been divided in sectors in this way the sectors should be described with special reference to the important landmarks in them. The description should be done methodically from sectors of the left to the sectors of right and the sectors of the foreground first, then middle distance and the distance. When the landmarks of the sectors are being described they should also be named by the sub-unit commander. And if section commander likes to use the landmarks in future, he should also number as the first point of reference, second point of reference, and so on.

Specimen :—"No. 1 Sec.—200—One fourth left (Ek chautha baen)—One palm (Ek khajji ka darakht)—Name palm (Nam Khajji) —The first point of reference for the section (Section ki pahela madad ki nishan)."



DESCRIPTION OF A GROUND
Fig. 38

26

JUDGING DISTANCE

1. Introduction

Every soldier must be well trained to judge the distance as accurately as possible without using any measuring instrument. Because this knowledge is highly required to locate the enemy and also to get maximum fire effect. This knowledge is particularly required in the case of light machine gun, because of the close grouping of the gun. Usually a soldier of infantry does not open fire at ranges over 300 yards, but he must be able to judge distance upto 1,000 yards, so that he can (*a*) indicate targets to supporting arms, (*b*) pass correct and detail information of enemy, when he acts in observation. Distances can be determined normaly by two methods (*i*) by observation of fire, and (*ii*) by judging distance.

Observation of fire is not always possible, and may cause premature opening of fire and also wastage of ammunition.

2. Methods

The following methods are normally used.

(*a*) *Unit of measure method :* In this method the intervening ground is measured in terms of some familiar unit, usually a unit of distance of 100 yards. This method is good only for short distances and when all the intervening ground is visible.

To get an idea of this method flags should be posted at various (100, 300, 400 yards) distances in a few directions and students should be told to see the flags from standing, kneeling, sitting and lying positions.

(*b*) *Key range method :* In this method the distance is judged with reference to a known range, that is, if the distance of a particular range is known, that is utilzed as key, *e.g.*, distance between telegraph posts, distance between mile posts, etc., are usually known. So with the help of these features, the distance of the object from the point of observation may be judged.

(c) *Appearance method* : In this method the distance is judged by the appearance of an object (normally man) in relation to its size visibility. How a man (standing) will appear at different distances has been noted below :

(*i*) at 200 yards : All parts of body are distinct ;

(*ii*) at 300 yards : Outline of the face becomes indistinct ;

(*iii*) at 400 yards : Outline of the body remains, but the face becomes difficult to be distinguished ; a man looks more or less like a bottle ; a man will be covered by the blade of foresight of a rifle.

(*iv*) at 500 yards : Body appears to be tapered towards the head ; limbs can be distinguished by movement.

(*v*) at 600 yards : The tapering of the body is very prominent, the limits cannot be seen—a man appears as a dot.

To see these points actually peoples should be kept at different distances and observed.

(*d*) *Bracketing* : In this method the observer guesses the longest and shortest possible distances of the object. Then either he fires two shots on those two (longest and shortest) ranges, he observes the distances of the shots from the object and approximates gradually to the object, or the observer takes the mean of the longest and shortest possible distances estimated by him.

This method is usually used by the artillery.

(*e*) *Halving method* : In this method an object is chosen at half distance and the distance of the object is estimated first, then the range is doubled to get the actual distance.

(*f*) *Section average* : In this method the section commander tells all the soldiers of the section, to estimate the distance. Then the section commander finds out the average ; and this average is regarded as the actual distance.

These last two methods are now regarded as ineffective and so are not used for any practical purpose.

3. Conditions affecting judging distances

Whatever method may be used everybody must remember that this estimation is only approximate and not accurate. There is a tendency to over or under estimate the distance and the judgment is always influenced by weather, conditions of light and nature of ground.

(*a*) *Distances are underestimated when* (*i.e.* the objects appear near then they really are) :

(*i*) The light is bright and is coming from behind the observer.

(*ii*) The object is comparatively large than the surroundings.

(*iii*) The object is placed at a higher level or at the top of a hillock or hill.

(*iv*) The ground is coverd with snow.

(*v*) There is dead ground in between the observer and the point of observation.

(*b*) *Distances are overestimated when* (*i e.* objects appear at greater distances than they really are) :

(*i*) The light is subdued or the light is comming from behind the point of observation.

(*ii*) The object is smaller than the surroundings.

(*iii*) The object is placed at lower level.

(*iv*) The line of sight is confined within narrow limits.

(*v*) The weather is foggy.

(*vi*) The object is similar in colour with the background.

Both underestimating or overestimating are harmful, but it is better to underestimate than overestimating.

27

INDICATION AND RECOGNITION OF TARGETS

1. Introduction

Every soldier must be thoroughly conversent with all the methods of indicating targets and also to recognize the targets indicated by any standard method, because the method of indicating targets will vary according to the nature of the ground and also of the target. Remember, it is not very easy job to find the enemy and to indicate his position to others.

To ensure quick and accurate indication of targets some standard methods have been laid down.

2. Methods

(*a*) Indication by simple description : This is the simplest and easiest method. This method can be applied only when the target is obvious.

Specimen :—"No. 1 Sec.—Look front (Samne dekh)—Small building (Chhota haveli)—Enemy post (Dushman ki post)."

(*b*) Indication by direction : This is also a simple and easy method. This method is applied when the target is obvious but situated not exactly in the general line of sight but on some sides,

Specimen :—"No. 1 Sec.—300—Half left (Andha baen)—Grove of trees (Darakhto ki jhum)—Enemy post (Dushman ki post)."

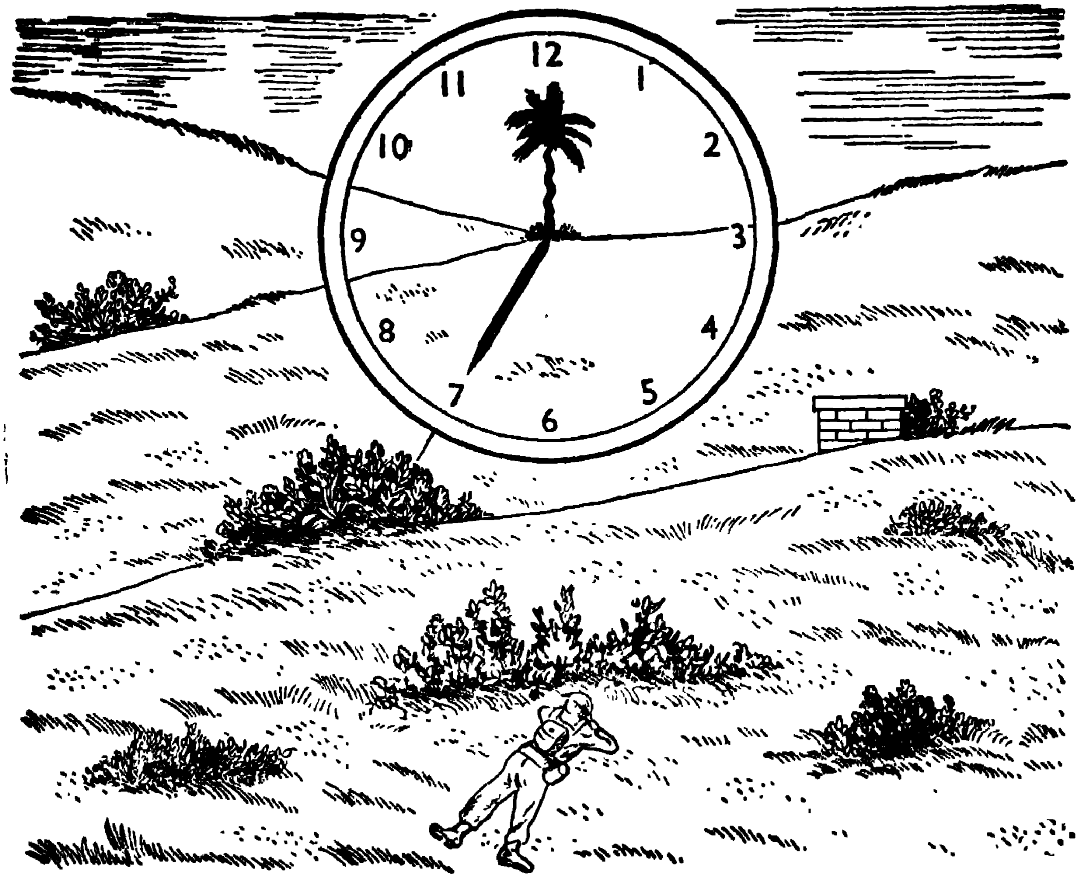
(*c*) Indication with the help of the last target : This method is not so simple as the preceding ones but also not difficult. This method is applied when the new target is located near the last target.

Specimen :—"No, 1 Sec.—300—Last target (Akheri target)—Slightly right (Thora dahine)—Lone tree (Akeli darakht)—Enemy post (Dushman ki post)."

(*d*) Indication with the help of reference points: This method is applied when the ground is not very simple, that is, the ground is rich with features—natural and artificial. When the ground is described by the commander, he also marks out certain important features as points of reference and names these points as building, bridge, wall, etc. This method can be used only when the target is situated close to any point of reference.

Specimen :—"No. 1 Sec.—250—Building (Habeli)—Slightly left (Thora baen)—Bush (Jhari)—Enemy post (Dushman ki post)."

(*e*) Indication with the help of an imaginary vertical clock: This method involves imagination of a transparent clock placed vertically before the firer on the ground. Generally this is done in conjunction with a reference point. The reference point is taken as the centre of the vertical



IMAGINARY VERTICAL CLOCK
Fig. 39

clock. To use this method first of all the reference point is to be indicated, then the direction of the object is pointed by its position right or left of the centre followed by the appropriate clock hour. The direction upwards or downwards should not be used.

This method should be used when the ground is under clear view.

Specimen :—"No. 1 Sec.—400—Palm tree (Khajji)—Left (Baen) —7 O'clock (Sat baje)—Bush (Jhari)—Enemy point— (Dushman ki post)."

(*f*) Indication with the help of degrees : In this method targets are indicated by the help of degrees. But these degrees are not measured by any instrument, so these are also approximate and not accurate. But for war purpose this method serves well when its becomes difficult to indicate the target with any other method, particularly when enemy post is perfectly dissolved in the background. Normally this method is used in conjunction with reference points.

Specimen :—"No, 1 Sec.—300—Tree (Darakht)—Right (Dahine)—8°—Bush (Jhari)—Enemy post (Dushman ki post)."

Usually in the field different parts of the hand when held at arm's length is used to measure the degrees, also some parts of certain weapons are used.

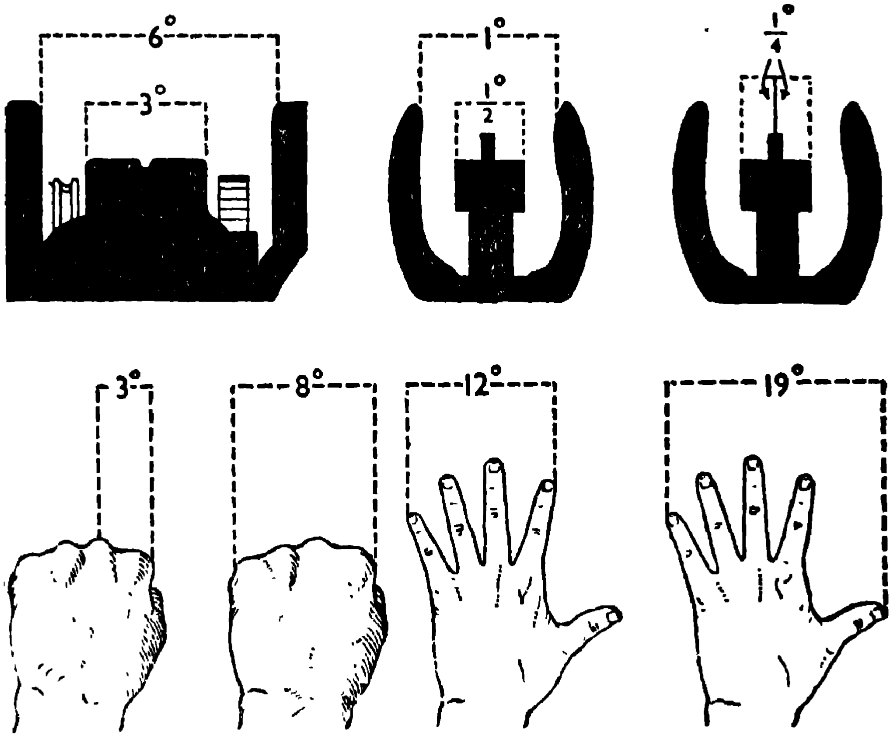
The actual methods of measuring the degrees have been undernoted :

The degrees		**Method of measurement**
(*i*)	$\frac{1}{4}^\circ$	Two sides of the tip of foresight blade of a Rifle.
(*ii*)	$\frac{1}{2}^\circ$	Shoulder of the foresight of a Rifle.
(*iii*)	$\frac{3}{4}^\circ$	Shoulder of the foresight of a L.M.G.
(*iv*)	1°	Protector of the foresight of a Rifle.
(*v*)	2°	Protector of the foresight of a L.M.G.
(*vi*)	3°	Shoulder of the backsight of a Rifle and also first two knuckles of the hand.
(*vii*)	6°	Protector of the backsight of a Rifle.

(*viii*) 8° First four knuckles of the hand.
(*ix*) 12° Tips of first four fingers (extended).
(*x*) 19° Tips of all five fingers (extended).

When Rifle or L.M.G. is to be used they must be placed at aiming position.

(*g*) Indication with the combination of vertical clock method and degree method : This is the last resort to indicate a target when all other methods fail. This method is used when more than one similar targets are placed along one clock ray and also very close to each other, so that mentioning of distance is also of no help.



ESTIMATION OF DEGREES
Fig. 40.

Specimen :—"No. 1 Sec.—400—Small hill (Chhoti tila)—Left (Baen)—10 O'clock (10 baje)—1°—Bush (Jhari)—Enemy post (Dushman ki post)."

3. **Points to note**

(*a*) Use the simplest possible method of indicating.

(*b*) Don't try to take help of any moving object or anything capable of movement in indicating target.

28

CONCEALMENT

1. Introduction

Concealment is the art of keeping oneself hidden from enemy's observation and fire but at the same time keeping one's own view, scope of employment of weapon and movement unhindered. To avoid the fire of enemy everyone must remain unseen by enemy. This is required for both offensive and defensive purposes. As soldiers of the present time do not put on any armour so they must be able to utilize the available ground to serve the purpose of protection. One must always remember that one is not always seen from the ground only but is also seen from air. So care should be taken to keep everything hidden from enemy's aerial observation also.

2. Cover

Any feature on the ground which protects one from enemy's view or fire is regarded as 'cover'. Some of the covers afford protection only from enemy's observation and this type of cover is known as 'cover from view'. Cover from view is not always cover from fire. Other type of cover protects one from enemy's observation and also from enemy's fire, this type of cover is known as 'cover from fire'. One should be well trained to select a cover from fire instantaneously, as a very short time is only available in war to decide. Cover from view is always in plenty but covers from fire are few.

TYPES OF COVER USUALLY AVAILABLE IN THE GROUND

(*a*) Undulations and folds on the ground : Easily available in any ground. These offer good protection from view, and enemy can hardly detect it. If used tactfully, it also protects from fire.

(*b*) Ditches, dry drains, road side slopes : Not always available. These are good cover from view and also from fire.

(*c*) Bushes and hedges : Small isolated bushes are usually available, though hedges are not so common. These are only 'covers from view' and NOT cover from fire. If bushes are only a few in a ground, then enemy can easily detect it.

(*d*) Standing crops : Available during some particular seasons in villages. The use of this depends on the height of the standing crops. These offer excellent cover from view but not from fire. And this cover warrants own movement and use of weapons. Slightest movement in the crops causes long waves of movement at the tips of the crops.

(*e*) Gardens and woods : Not always available. These offer good cover from view and also from fire. If tactfully utilized, enemy can be harassed easily.

(*f*) Huts and buildings : If complete huts and buildings are not available, broken parts are usually available. These offer good covers from view and fire but are easily marked out by enemy and at times restrict movement.

(*g*) Walls and mat walls : Usually available as broken small isolated features. These offer good protection from view and fire and at times also allow safe movement, but very easily detected.

3. **Guides for concealment**

There are certain principles, which if followed meticulously help much in concealment. The key word 'BASSWOOFF' will remind one the principles.

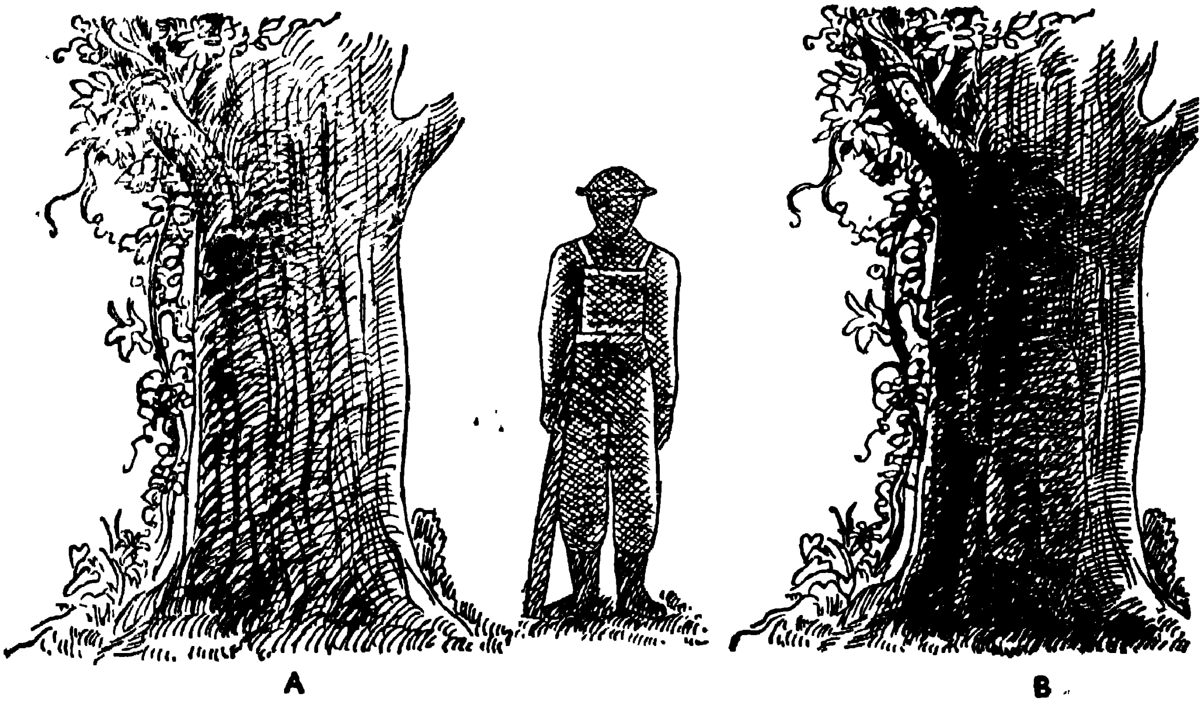
(*a*) B—*Background* : One must melt in the background. Background should always be selected carefully—an uneven background is always preferable to a smooth background. Fire trenches also should be blended with background. Remember, *background for an observer from air is ground where one stands.*

(*b*) A—*Aircraft* : One must always bear aircraft in mind when one plans for concealment. Regular patterns in open ground and shadows help in easy detection from air, so these must be avoided. One should NOT look up at aircraft unless it becomes a real necessity.

(c) S—*Shine*: Shine catches the eye even from a long distance. So everyone must be shine conscious rather shine shy, that is, no shining metal should be allowed to remain with. Shining parts of the weapons or dress should be blackened.

(d) S—*Skyline*: Skyline makes even a small object or slight movement conspicuous and helps in detection. So skyline must ALWAYS be avoided during day and night.

(e) W—*Water-shadow*: Undisturbed water works as an inverted skyline. If one conceals oneself in a place near a waterlogged spot, image of that one may be cast on the

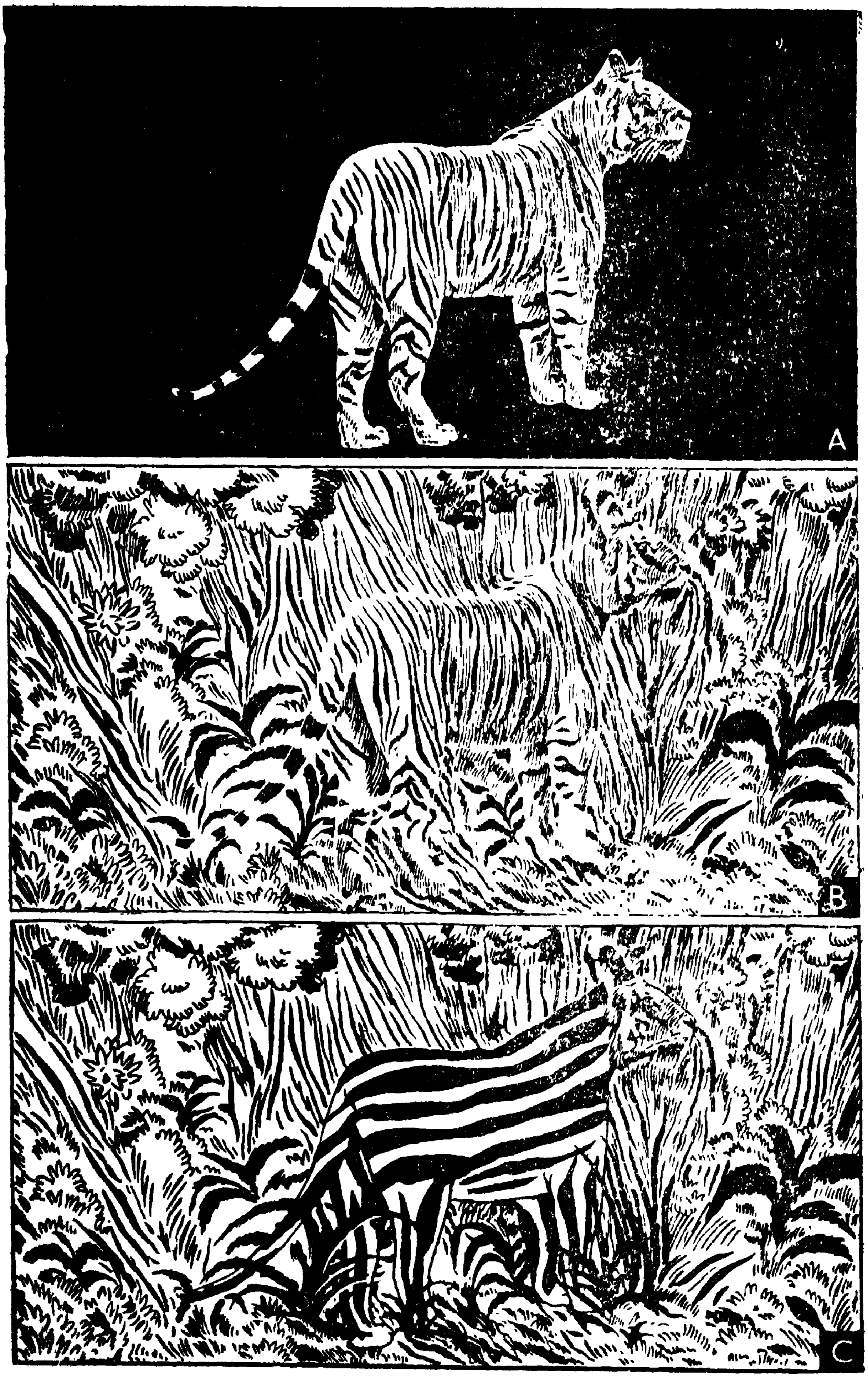


UTILIZATION OF THE BACKGROUND

Fig. 41: The value of a background depends on its proper utilization. A. A soldier is standing by a side of the tree and he is conspicuous. B. The soldier is standing in the front of the tree and he is completely hidden

SELECTION OF BACKGROUND

Fig. 42: To conceal oneself, background should be very carefully selected —the character of the background and that of the individual should be the same. A. The tiger is conspicuous against the wrong background. B. The tiger is completely hidden against native background. C. As the pattern on the body of the tiger is not similar with the pattern of the background the tiger could not conceal.


A
B
C

water, and this water shadow can easily be detected from air or even from ground. So care must always be taken to avoid water shadow.

(*f*) O—*Ostritchwalk* : It is a general tendency to walk or even to run by the side of low wall in a stooped fashion looking like an ostritch. But if one moves even for a small length of distance in that fashion the head of that one gradually goes up even without one's own knowledge. When one's head comes above the low wall it makes oneself conspicuous and thus one becomes vulnerable. So *ostritchwalk must always be avoided.*

(*g*) O—*Observation* : Observation and firing must always be done round the side or through the cover and NOT over it.

(*h*) F—*Fading* : One should fade away gradually and slowly when moving from one place to other. A slow and gradual movement is less likely to be seen than a rapid one.

(*i*) F—*Freezing :* One must freeze when halted or when illuminated. Slightest movement may catch the eye but if one stands still one may be mistaken as something else.

4. Points to be noted

(*a*) Each individual soldier is responsible for his own concealment.

(*b*) Selection of cover should be careful but quick. The following points should be guiding factors in selection of cover :

(*i*) Cover should NOT be an isolated or conspicuous feature on the ground.

(*ii*) The way to the cover should also be a protected one.

(*iiii*) There should be protected outlets from the cover to other points.

(*iv*) One should be able to remain in the cover for a long time without taking strain.

(*v*) One must be able to employ weapon from the cover.

(*vi*) One must be able to observe enemy's movement at ease.

(*c*) In taking a position one must act as follows :

(*i*) Reconnoitre first the site and decide how best advantages can be derived from the covers.

(*ii*) Select the way in and way out of the cover.

(*iii*) Take care to see that one's own cohesion with the team will not be disturbed.

(*iv*) Maintain strict discipline.

(*d*) One must NOT think that concealment alone makes oneself completely safe.

(*e*) One must NOT fire from one cover for a long period.

(*f*) One must NOT expect to get NO obstacle when one is moving from one cover to the other.

29

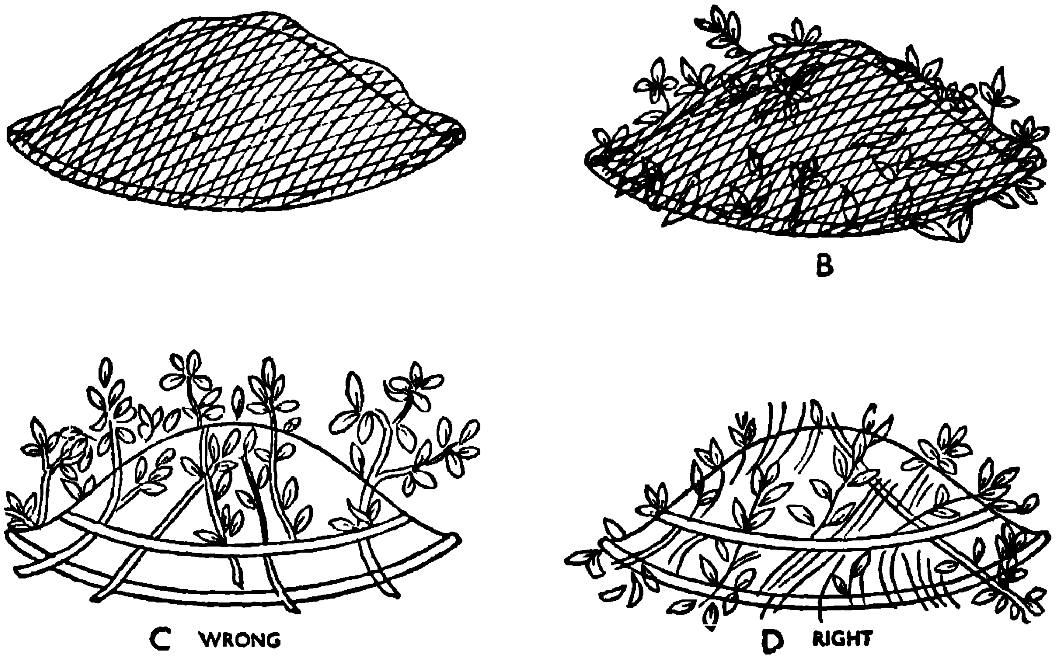
CAMOUFLAGE

1. Introduction

Camouflage is any and every means of breaking one's own outline to melt oneself with one's own background. Camouflage is also described as artificial measures to achieve concealment.

2. Necessity

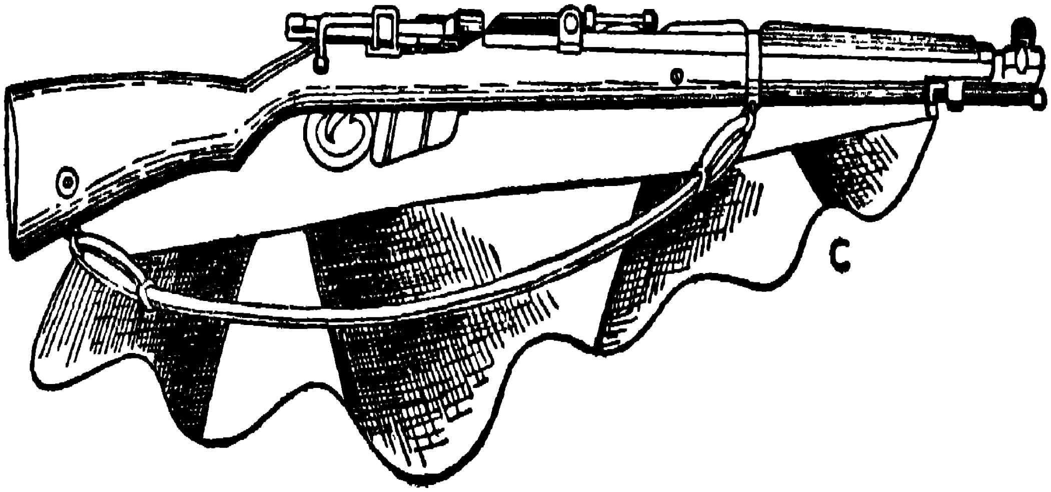
It is not always possible to get covers in the ground to help concealment. Then to achieve concealment one must use some artificial ways and means to hide troops, weapons and vehicles from enemy's observation.



METHODS OF CAMOUFLAGE

Fig. 43 : Helmets can be camouflaged with intelligent use of hessian nets and vegetations but careless use of the articles will not be effective. A. The helmet is camouflaged by loosely fitted hessian net. B. The camouflage has been achieved by use of the hessian net and twigs together. C & D. Twigs and leaves have been used to achieve camouflage but one is correct, the other one wrong.

But one should always remember that the object of camouflage is *offensive*, that is one must surprise the enemy by hiding one's own identity and position by camouflage. Disguise, make-beliefs, efacement, mimicry are all connected with camouflage.



CAMOUFLAGE OF RIFLE

Fig. 44: Weapons can be camouflaged by disturbing the normal colour or by breaking the outline of their body. **A.** A rifle closely packed with light coloured canvas. **B.** Black and white coloured papers or clothes wrapped over a Rifle in a haphazard fashion. C. Only a strip of light coloured hessian fitted with a rifle to break the outline.

3. Rules of camouflage

(*a*) Use face veils or face powder and helmet nets decorated with local vegetation to break the outline.

(*b*) Use fresh vegetations.

(*c*) Darken all shining parts of the dress and weapons.

(*d*) Surrounding landscape should be copied in colour, tone and pattern.

(*e*) Change of place will necessitate discarding the materials already in use and utilising new materials to suit the new place.

(*f*) No trace should be left behind when abandoning one position for other.

(*g*) Do not overdo camouflage.

(*h*) Camouflage should NOT be done on any fast moving object.

(*i*) Camouflaging must be completed before being spotted out by the enemy.

4. Why objects are seen

Objects are seen from far for the reasons mentioned below :

(*a*) *Shine* : Shining materials can be noticed from a very great distance.

(*b*) *Shape* : A Shape different from the surrounding objects is easily noticed.

(*c*) *Shadow* : Shadow on ground or on water can disclose the position of some body.

(*d*) *Silhouette* : A darkened figure against light or a figure conspicuously different from its background can easily be spotted out.

(*e*) *Surface* : Usually slight difference in surface colour make any object distinguished from the other objects of surroundings. The surface of human body *i.e.* the skin is not only different from all other objects but also shiny. So if [illegible] not discoloured properly, one will be easily seen from far.

(*f*) *Spacing* : In nature nothing develops at regular space intervals. Few plants may grow very closely, but some will be at distances. Therefore, regular spacing of individuals, even a meticulously camouflaged section, will attract attention.

(*g*) *Movement* : Slightest movement of any limb makes a thoroughly camouflaged individual seen. When people are still, it may not always be possible for any observer to locate, but slightest movement will attract attention.

To memorize these points, remember, six 'S' and one 'M'.

5. Advantages and disadvantages of camouflage

Everyone should understand that camouflage has advantages as well as disadvantages.

(*a*) When any object is stationary and camouflage is proportionate with the background it is good for hiding the object.

(*b*) Properly done camouflage affords deception and surprise.

(*c*) Movement with camouflage attracts attention. For this reason men with proper camouflage should try to move in such a way which may be compared to photographic fade in and fade out.

30

FIRE POSITION

1. Introduction

Every soldier should be so trained that he can select fire position in any and every type of ground. It is not possible to operate weapons safely from all places of a ground—certain points provide safety of ownself and good field of observation and fire. Fire position should be selected at a moment's notice.

2. Qualities of a Fire position

An ideal fire position should—

(*a*) Facilitate a good view of the ground and target ;

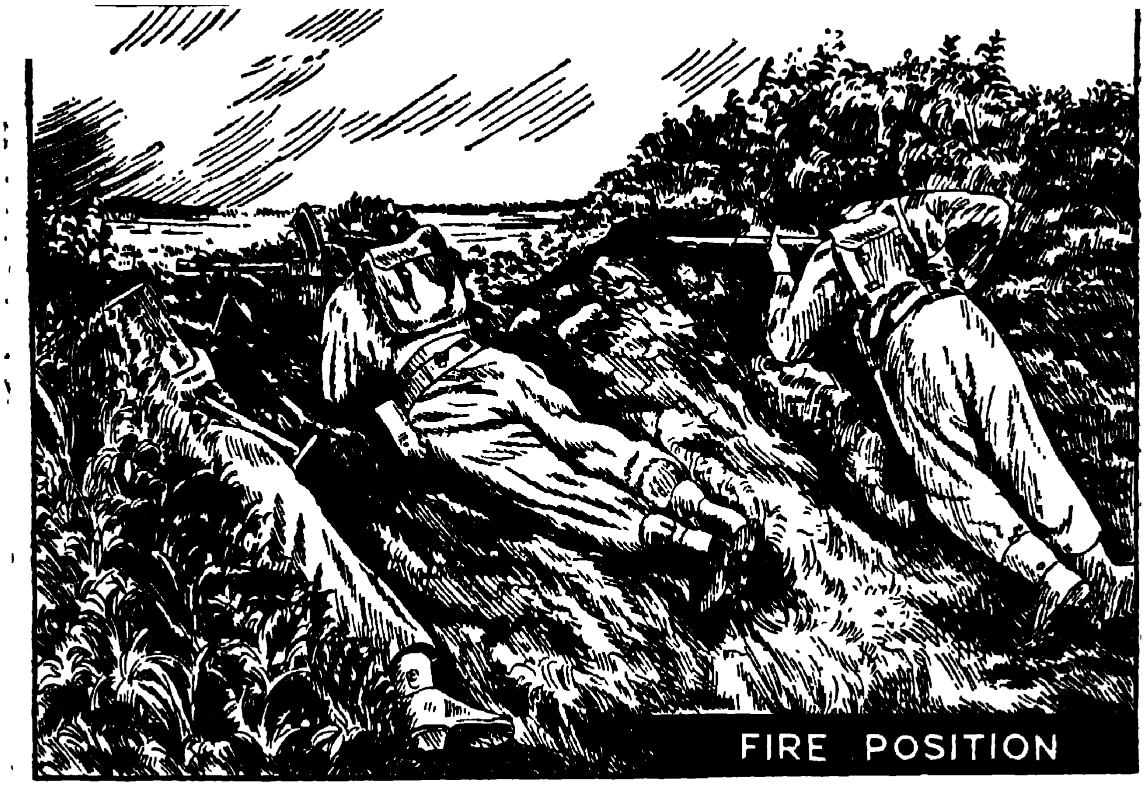


Fig. 45 : Though it is not always possible to get an ideal fire position at every field of operation, yet every soldier should be so trained that they can find out the best possible fire positions at a glance and in possible cases can improve the position.

(*b*) Have cover from view and fire from both ground and air ;

(*c*) Have covered way in and way out ;

(*d*) Provide room to employ weapons easily, preferably in more than one direction ;

(*e*) Should be so commodious that a soldier may stay there for a long time ;

(*f*) Should have some other good fire positions in the near vicinity ;

(*g*) Must NOT be any or near any important feature.

3. Points to remember

(*a*) It is hardly possible to get ideal fire positions always.

(*b*) Care must be taken in positioning a weapon on the level from which that is fired.

31

OBSERVATION

1. Introduction

Observation is of paramount importance at all stages and at all times. There is a good slogan—'*sees first shoots first*'—which speaks aptly the importance of observation.

Observation can be done by an individual or by a team *e.g.*, a section, etc. But in any case the observer must know how to observe and what to look for, otherwise he will not be able to observe properly.

Only a few men are instinctively good observer, so training must therefore be methodical and thorough.

2. Methods of observation

Method of observation during day varies from that of night. But in all methods there are certain fundamental principles which have been enunciated below.

(*a*) *Selection of an observation post* (O.P.) : An observer, first of all should select an O.P. The following points should be taken care of during selection of O.P.

(*i*) O.P. should be placed ahead of own area.

(*ii*) O.P. must be higher than the area to be observed.

(*iii*) O.P. must not be a conspicuous place.

(*iv*) O.P. must be covered and have covered approaches to and from. If cover is not available, a place should be selected where the observer can melt in the background.

(*v*) O.P. must NOT be placed in skyline.

(*vi*) O.P. should be in same tone with the background.

(*vii*) It is preferable that the O.P. is located in shadow.

(*b*) *Points to remember when in O.P.*

(*i*) Movement must be avoided. If movement is necessary, move slowly and gradually.

(*ii*) Observation should be done round or through the cover and NOT over it.

(*iii*) Observer should be camouflaged.

(*iv*) Smoking must be avoided. Smoke by day and light by night can be seen from a long distance.

(*v*) While standing, observer must not keep the legs apart or hands on hips.

(*vi*) The area under observation should be divided into fore-ground, middle distance and distance and then in left and right sectors.

(*vii*) Features on the area should be noted, so that any irregularity anywhere can easily by detected.

(*viii*) Observer must try to know how to interpret enemy signs or movements.

(*ix*) If observation is carried on from any room, observer must keep well back from the window or door.

(*x*) Talking or making sound should be avoided as far as possible.

(*c*) *Observation by a team, e.g.,* section.

If a team is deputed, it is so done for all round observation. So it becomes the responsibility of the commander of the team to organize the team and to make plan for the purpose. But there is no definite method for doing this. The section must observe continuously intelligently and intensely. Anything observed by any man of the team should be reported immediately to the commander. The commander should send back the information to the next higher commander and also record in the log book.

(*d*) *Observation by Night.*

(*i*) Observation during night or in fog is a matter of great strain, so observers should work in pairs and also for shorter span of time.

(*ii*) Observers should see the ground during the day, or at least during twilight, to note all the features on the ground and should memorize them. This helps in identifying any irregularity.

(*iii*) No observer should stare at one object for a long time. The object, in that case, appears to move.

(*iv*) Observation will be clearer if observer looks from a lower level, for this reason it is advised that during night observer should be on the ground. *Visibility is good against the skyline—but observer must not move in the skyline.*

(*v*) Observer must remain quite and silent.

(*vi*) Observer must use ears and eyes. Important information can also be collected from the sounds heard. The following are the more common noises which may be heard at night besides those of firings : (*a*) filling of water bottle, (*b*) partly filled water carrier, (*c*) digging, (*d*) talking, singing, and whispering, (*e*) movement over dry leaves.

(*vii*) Observer must be light conscious. If a bright light is fired near the observer, he should freeze.

(*viii*) During dark, people generally overestimate the danger. Distance appear to be lesser than actual and strength of enemy appears to be greater than actual. So opinions from two persons should be considered.

3. Increase in observation capacity

The capacity of observation may be increased sufficiently by training. A few ways of training have been mentioned below.

(*a*) Memorizing the routes and locations from map or sand-model and describing them.

(*b*) Observing some articles for a very small length of time and memorizing them.

(*c*) Observation during route march/night march, etc., quizzes on the marches are very helpful.

32

PATROL

1. Introduction

The small detachment which goes forward to bring information of enemy and leads units of own people is known as patrol.

Patrolling is the responsibility of all arms. Sometimes people from the technical units also go out for patrolling to get technical information.

Efficient patrolling is essential during every phase and type of operations. Success of army depends much on the efficiency of patrol.

2. Necessity

Patrolling is necessary to get advance knowledge of enemy and of the terrain.

Patrolling is also nacessary to check enemy from getting the information about own people.

3. Tasks

(*a*) To gain information of :
- (*i*) Enemy position, strength, and weapons,
- (*ii*) Morale and habits of enemy,
- (*iii*) Identity of enemy,
- (*iv*) Activities and programmes of enemy,
- (*v*) Ground—with special reference to natural and artificial obstacles ; and routes for tanks, artillary, etc.

(*b*) To deny information to the enemy by following methods :
- (*i*) Dominate 'NO MAN'S LAND' and keep the enemy far away from own people,
- (*ii*) Destroy enemy patrols and OPs.,
- (*iii*) Drive out any enemy move to collect information.

(*c*) To maintain initiative in the following ways :
- (*i*) Harass the communication and zeal of enemy,
- (*ii*) Destroy the bridges behind the enemy, depots of oil, ammunition, and supply,

(*iii*) Arrange ambushes,

(*iv*) Arrange patrols on flanks and rear during the withdrawal to harass the enemy's offensive measurers.

4. Types of petrol

Now-a-days it is regarded that there are only two types of patrol (A) Reconnaissance, and (B) Protection.

All other types of patrols of older days are essentially part of one of these two types. Types, names and strength of patrol unit depend upon the task for which it is sent. Usually one officer and a few men constitute a party and usually it carries all normal platoon weapons with it.

5. Stages

A patrol goes through following stages :

(A) Preparation,
(B) Conduction,
(C) Debriefing.

(A) *Preparation* : Usually patrolling is co-ordinated at Brigade level. Brigade headquarters briefs the unit patrol master (normally the 2 i/c of the unit), who in turn selects patrol leaders and men going for various patrols and also brief the patrol leaders.

(*i*) *Selection of individuals* : The following points are usually considered before selecting individuals for patrols :

(*a*) Intelligence of the individual,
(*b*) Spirit of the individual,
(*c*) Promptness and alertness of the individual,
(*d*) Discipline of the individual,
(*e*) High skill in fieldcraft,
(*f*) Mastery on weapons.

Usually a new sepoy is NOT sent with patrol. If in any case a new sepoy is detailed for the purpose, special care must be taken to see his personal welfare.

(*ii*) *Briefing* : It is desirable that the briefing is done on a sand model.

The following points are usually included in briefing :

(*a*) *Task* of the particular patrol—this is also known as the *policy*. The policy involves the method of fulfilling the task.

(*b*) *Information* regarding enemy and also of own troops. It should also include whether any other patrol units are going out.

This must include the result of tussle with enemy, if there is any. In describing the result all details regarding casualties, Prisoners of War, weapons used by enemy, etc., must be narrated.

(*c*) Times for going out and coming in.
(*d*) Suggested routes for going out and coming in.
(*e*) Information regarding neighbouring troops.
(*f*) Any administrative point—this must include the welfare of the people of patrol.
(*g*) Additional information regarding the terrain, which are not given in the map.

The briefing is usually done sufficiently before the sunset so that the patrol leader gets enough time to make his own preparation.

(*iii*) *Warning order* : After receiving the orders the patrol leader issues an warning order to his men. Warning order includes the following points :

(*a*) Names of the individuals going out for the patrol,
(*b*) Dress, arms, and equipments, usually the individuals of Recce patrol go lightly dressed—even they do not put on ammunition boot, but cover their feet by canvas shoes ; and they carry light weapons ; whereas the individuals of Protection patrol are always heavily equipped ;
(*c*) Instructions about food, water, and rest,
(*d*) Time and place (rendezvous—RV) for further orders,
(*e*) Security measures, *i.e.*, NO documents, paybook or any indentification card or any such article should be carried. All 'Warning order' must be preceded with the phrase 'Warning order'. The warning order must be clearly understood by all individuals.

Warning order must end indicating the earliest time for action. The leader must say 'No move before ....hrs'.

(*iv*) *Reconnaissance* : After issuing the warning order the patrol leader goes out for reconnaissance. He studies map sheet, air-photos and proceeds to a nearest point from which he can get reasonable view of the ground. He appreciates the whole situation and prepares his orders which include the following points :

(*a*) Exact routes for going out and coming in, possible bounds, possible obstacles, possible ambush places, prominent objects to help him in keeping direction.

(*b*) The point where he must finally reach to carry out his task.

(*c*) Formation of patrol unit.

(*d*) Action if attacked.

The verbal order of the patrol leader must be passed down to every individual of the patrol unit. The order should be a full order according to the standard sequence, *i e.*, as per follows :

"Information about enemy and about own troops—

Intention (clear and precise).

Method—it includes time and routes out and in, formation of the patrol unit, detailing of scouts, main body and get-away-man, directions of observation, final point of observation, action if attacked ; if anybody gets lost where to wait.

Administration—it includes weapons, ammunition, and equipment.

Intercommunication—it includes how to pass the information, the position of platoon headquarter.

Any question ?

Move !"

It is essential to ensure that every individual of the patrol unit clearly understands the order so that if the patrol leader becomes a casualty or the peoples of the patrol unit loose cohesion, they may act independently.

46

AMBUSH

1. Introduction

Ambush is the tactics of the guerilla war. The principal aim of this is to create confusion and chaos in the enemy by inflicting injury and causing harm to him at places where enemy thinks himself to be safe and secured. Seldom an ambush party aims to capture prisoners.

2. Basic principles

(*i*) Ambush is done by *small parties* on the *moving enemy.*

(*ii*) To be good in this operation people must be well trained in concealment, surprise and offensive action

(*iii*) Thorough knowledge on the enemy's habits, particularly their *weaknesses* must be known to the ambush party.

(*iv*) Before starting this operation the ambush party must carefully select the place for the purpose. The site of ambush must have concealed approaches to and from.

(*v*) A rendezvous for the ambush party also must be selected previously. At rendezvous the ambush party will assemble silently at the quickest possible time after the operation.

(*vi*) Ambush party withdraws always as soon as the aim is achieved,

(*vii*) To ambush enemy the passages in their front and rear must be sealed previously by laying mines or creating some other obstacles.

(*viii*) Men of the ambush party usually relax and take rest immediately before the operation. During this time alert sentries must be posted at different points to ensure their own security.

(*ix*) A protective party is also associated with the ambush party.

(*x*) Ambush party must rehearse in details whenever possible.

3. Tank haunting

Sufficiently trained ambush party can also haunt tanks. Actually one or two well trained infantry soldier can paralyse a series of tanks by the ordinary platoon antitank weapons. The greatest defect of a tank is the poor visibility of its crew and the weapons of tank cannot also be operated at an area very close to the tank. So, if the tanks can be engaged by Bren gun or by some other weapon from a safe distance, one or two people can easily go very near to the tank and destroy them. This has been well menifested during the recent Indo-Pak conflict, where ordinary infantry soldiers paralysed series of the best tanks.

47

JUNGLE WARFARE

1. Introduction

Military training in India will remain incomplete if some training in Jungle Warfare is not given. The entire Northern and North-Eastern border of India is covered with jungles. Jungles of different sectors are of diffrent nature. Whatever may be the type of trees, the technique of warfare basically remains the same. Much lessons about this jungle warfare have been learnt during the last World War II while fighting in Assam and Burma. Presently after the Chinese aggression, the importance of Jungle Warfare is being felt much more than before.

2. Scope

Jungle warfare requires intensive practical training. The following aspects of jungle warfare will be described in brief here :

(a) Characteristics of the jungle

As has been described earlier every jungle has its own characteristics. Some of the characteristics of the jungles are given below—

(i) *Terrain*

The jungles in the NEFA area are similar to that of Doon Valley. These jungles are covered with dense forests and are situated on the mountain ranges of several thousand feet high, with narrow rivers and rivulets flowing with strong current to the low lying plains. There are areas of open, semi-open and semi-cultivated lands around villages and along valleys. Vehicular movements in these areas are difficult and restricted, and in places not possible. Land slides are common.

(ii) *Climate*

The percentage of rain fall in jungles, particularly in NEFA area is great. Heavy downpour of rain with thunder storm and strong storms are very common phenomenon in this area. The excessive rain fall with storm make land, air and wireless communication difficult. Heavy fog in the morning is also common. Excessive humidity affects adversely on arms and equipments.

(iii) *Distances*

As most parts of this area are covered with thick jungles with dense undergrowth, where few tracks exist, movement is very difficult, and as such distances are measured not in terms of yards/miles but in terms of time. One hundred yards in one type of jungle may be different from a hundred yards of another and therefore time taken to traverse that distance may be considerably different.

(iv) *Communication*

Jungle areas are relatively underdeveloped in comparison with the plain land and therefore road development is considerably poor in these areas. It is also seldom possible to construct new tracks to take heavy vehicles. Foot-paths normally exist along the banks of rivers or streams. Inland waterway are a good means of communications at some particular season.

(v) *Visibility*

Owing to the thick cover, field of view is restricted ; sometimes even up to 5 yards. Due to lack of visibility troops are very often captivated with psychological loneliness and fear. The defender must keep eye in all directions.

(vi) *Disease*

Usually jungles are abode of a number of peculiar insects and germs. Malaria, diarrhoea, dysentry, typhus, hook worm and snakes abound in jungle areas. Besides these there is another type of disease, commonly called jungle sores. Because of all these hazards a high standard of physical fitness is required. Regulations regarding personal hygiene and water discipline have to be strictly maintained. Drinking water from rivulets, streams and pools are definite causes of some of these diseases.

(b) **Tactics in jungle warfare :**

Operation tactics in jungle areas are much in common with that of night operations. The jungles usually favour the determined attacker, but it may be of great advantage to defender also, if they can utilize the jungle cleverly. Defence must not be static or passive. The aim in jungle must be to hit and harass the enemy at every stage by ambushes, strong patrols and snipers to demoralize him completely and finally destroy enemy with offensive action from a firm base. In dense jungles troops generally follow jungle trails, game paths and water courses. So better trained soldiers can lay an ambush at short notice and can destroy the enemy by trapping them.

(c) **Supporting arms in jungle warfare :**

(*i*) *Individual*

Jungle war is every soldier's individual war. The control of commanders here is bound to be lag. In jungle warfare there are no non-combatants. Everyone must be a soldier, may he be a clerk, cook or a gunner. They must be ready to fight at every time. Everyone must be very strong in mind otherwise no one can withstand the climate in the jungle and the harassment by the enemy.

(*ii*) *Infantry*

Infantry is the only effective arm in the jungle owing to its comparative mobility; and bayonet is the most important weapon. Well trained infantry soldiers with able section leaders will ensure success.

(*iii*) *Armour*

With skill and determination and proper recce of the ground, tanks may be used in jungle warfare to a very limited extent. Tanks in jungles, can be easily ambushed and destroyed. Tanks must not be used in thick jungles.

(*iv*) *Artillery*

It is very difficult to deploy artillery in the jungle warfare because of lack of observation through dense forests and the problem of supply of heavy ammunitions. Only long range guns can be utilized from a distance on a fixed target.

(d) **Administration in the jungle**

To keep the soldiers mentally and physically fit, administration must be efficient, though it is very difficult for the following reasons :

(i) Lack of good roads for vehicles,
(ii) Long and precarious lines of communication,
(iii) Ability of the enemy to infiltrate and cut off the rear,
(iv) Dependance on man and animal for carrying loads, thereby restricting loads and equipments,
(v) Weather.

The following points are to be noted in Administration.

Clean food is essential. Dirty food may cause death or sufferings throughout life. Particular care must be taken for drinking water. Every drop of water which soldiers will take must be properly boiled and chlorinated.

Every individual must always carry with oneself the following items for safety precautions :

(i) Field dressing, (ii) Bottle of iodine for insect bites and cuts, (iii) Permanganate-of-potash for snake bite, water sterilization and disinfecting wounds, (iv) A new blade and some string for snake bite.

Even in dry weather, there are mosquitoes, ants and insects. Therefore olive green mosquito net or a beehive head net and gloves are essential. One must always keep one's sleeves rolled down and trousers tucked firmly into anklets. This is essential against the attack of leeches. Feet must be kept dry. Otherwise "Wesa" will eat away the soles of the feet.

One must carry haversack, compass, torch and watch and must always try to check the temptation of carrying more things as every additional pound will be an extra load to one's ownself.

Meticulous planning is, therefore, essential to move the supplies, equipments, etc. as far forward as possible, so that if there is a break in the communication, there will be minimum effect on operations. Every individual must be trained to take additional care of their personal clothing, arms and ammunitions so that load on this account may not be unduly burdened.

(e) **Jungle craft**

Soldiers fighting in the jungle must develop a 'Jungle sense' and 'Jungle eye'. The eyes must be trained to disregard the pattern of bushes and trees immediately in front and to see through the gaps and focus the eyes beyond.

As road communications are poor and undependable in the jungle, small bodies of troops can march and as such patrolling plays a prominent part here.

The map must be known thoroughly. Then after considering the information available, climate, routes, time, weather, etc.—a plan is to be prepared.

(f) **Some rules for jungle fighters**

[i] *How to walk in jungle country* :

(1) Always lift your feet and put them down with care.

(2) Never try to walk fast.

(3) Take short steps when going up hill and keep the upper portion of your body stooped down towards front, the steeper the hill, the shorter the steps and greater the bend of the body.

(4) Get off your feet whenever you can. Take a five minutes break for every half an hour. March all day long and only during day.

(5) Pick your route carefully and notice the country you pass through. Check your direction frequently.

(6) Put all your stores on your back.

[ii] *What to do when you get lost* :

(1) When lost you are only in danger if you loose your psychological balance. Fear of being alone in the jungle, drives some men to panic.

(2) Sit down, relax and think it over.

(3) You are lost only when you have no idea in which direction you should go.

(4) You can march for many days without any food at all, provided you keep calm.

(5) In enemy country, stay away from the trails, whenever possible.

(6) Rivers and stream valleys are the lines of human travel and settlement. So take due care of them.

[iii] *A few points to be noted during jungle war* :

(1) Fight to win. Try to surprise your enemy. Use all your strength and cunning.

(2) Nothing can stop a jungle soldier, if he has strong determination.

(3) The jungle is your friend, if you can use it intelligently.

(4) Guard your health—it is difficult to get treatment in jungle.

(5) Protect your arms and equipments—never leave them.

(6) Keep calm, silent, mobile and keep alive. Try to keep spirit high.

(7) Never fire blindly. Save ammunition

(8) Use team work, but do not depend on other's support.

(9) Melt into the jungle to kill more enemy, but do not surrender, unless caught by enemy.

FIRST AID

1. Introduction

This is the aid or relief given to any patient in the first stage before the arrival of a doctor. By the word patient it is meant that anybody suffering from an injury due to wound or fracture or some other similar reason.

2. Qualities of first aider

To be fit to render first aid to a patient one must have some special qualities, of which few noteworthy ones have been under-mentioned.

(*a*) *Observation power* : A first aider must have good observation power, so that by a glimpse to the situation and circumstances may note or guess logically the cause of injury and also note the signs of injury.

(*b*) *Tact* : A first aider must be tactful so that he can easily know the condition, symptoms and history from local information and at the same time can secure the confidence of the patient. Of course, in warfield it is easy to guess the condition and history of the injured, as these are obvious.

(*c*) *Resourcefulness* : It is rather impossible to get a patient in an ideal condition for first aid. So the first aider must have the capacity to make certain arrangement with the advailable materials to prevent further damage of the patient.

This quality is highly essential for a first aider who is to work in warfield.

(*d*) *Dexterity* : A first aider must handle a patient in such a way so that the patient gets the maximum pleasure under the situation.

(*e*) *Discrimination* : A first aider must be able to understand the comparative seriousness of injuries, when one patient suffers from several injuries.

(*f*) *Perseverance* : Whether the first aider attains success or not by his efforts he must have the zeal to continue his aid so long the doctor does not arrive or the patient is not transferred to any aid post.

(*g*) *Sympathy* : The first aider must feel for the patient, then only he can extend real help to the patient. He must also understand the psychology of the patient.

(*h*) *Explicitness* : The first aider must be able to give clear and unambiguous instructions to the patient.

A first aider MUST know that his duty does not involve the treatment of the patient, but his responsibility ends as soon as the doctor arrives.

In army, as a matter of fact, every soldier is a first aider and in most cases to his ownself. So nobody in war should expect or wait for some other for help.

3. Equipment

Every soldier is equipped with two bandages provided with sterilized cotton and ointment.

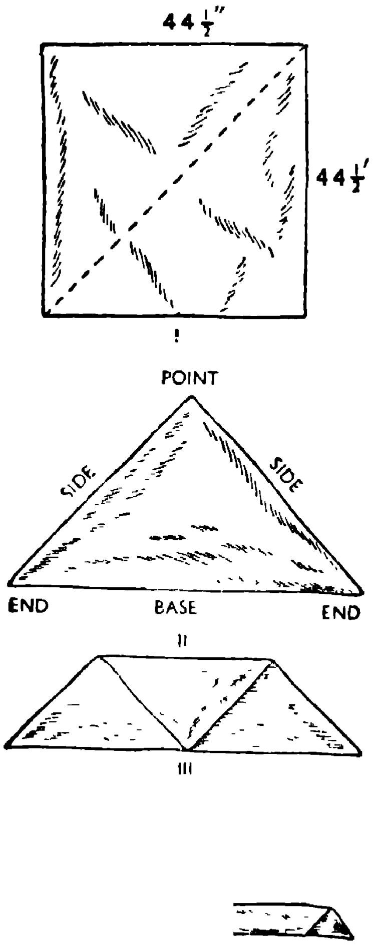
4. Tying of simple bandages

Every soldier must know how to tye simple bandages. A few types of simple bandages have been described below.

Generally for first aid the *triangular bandage* is used. This is made by a cloth of dimension of 44½" inches square. A triangular bandage may be made even from a cloth piece of 38" inches square ; but the latter size is regarded as the minimum size. Of the three sides of a triangular bandage the biggest side is regarded as base and the other two sides as sides.

A triangular bandage may be used to (*i*) control bleeding, (*ii*) prevent or reduce swelling, (*iii*) support an injured limb of the body, (*iv*) retain pressings and splints in position and to immobilize fractures.

The bandage may be applied as (*i*) *chest bandage*—when the cloth is spread out to its full extent, (*ii*) *arm sling*—when the cloth is folded only once in lengthwise direction, (*iii*) *broad bandage*—when the cloth is folded twice in lengthwise direction,



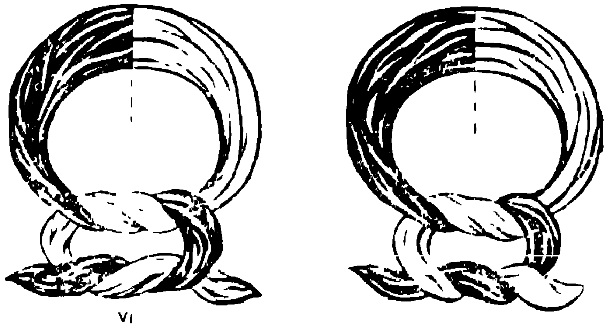
TYPES OF BANDAGES

Fig. 50 : Bandages form an essential part of first aid I A square piece of cloth usually used for bandages ; **II.** Triangular bandage—it can easily be made by folding the square piece along any diagonal ; **III & IV.** A Broad bandage—can be obtained by bringing the vertex of the traingular bandage to the centre of the base and then folding once in the same direction ; **V.** A narrow bandage—can be made by folding the broad bandage once only.

(*iv*) *narrow bandage*—when the broad bandage is once again folded in the same direction.

Bandages may be improvised from handkercheif, belt sling, cord, lanyard, etc.

Knot of the bandage ; Usually to secure the tying of bandage 'reef knot' is used.



KNOTS OF BANDAGES

Fig. 51 : There are many types of knots of bandages. **VI** Reef knot—usually this is used ; **VII.** Granny knot—this type of knot can slip down, so it should NOT be used.

5. Carriage of injured

An injured person may be carried from a field of operation to an aid post by the following methods—(A) support by a single helper ; (B) two-men seats ; and (C) stretcher.

Most often during operations injured persons are carried either by a single helper or by stretchers. The method of carriage depends on the undernoted points : (*a*) the nature of the injury, (*b*) the number of helpers available, (*c*) the distance to the aid post, and (*d* the type of route to be traversed.

Whatever method of carriage may by used care must be taken to see that the patient is being given maximum possible comfort, and any dressing etc. that might have been applied to the patient, does not get dislodged.

It is always desirable that the patient is transferred to the aid post at the earliest opportunity at the quickest speed.

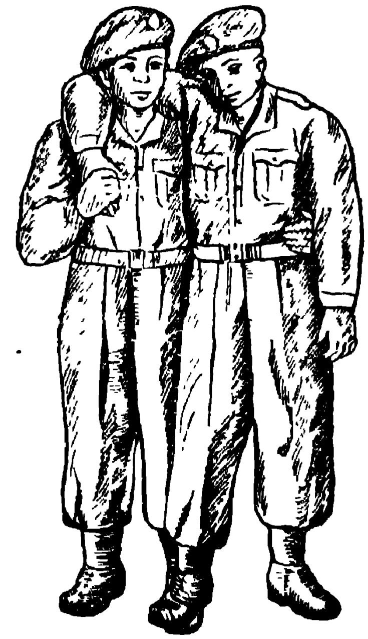
6 Methods of carrying

(A) Support by a single helper

A single helper can carry a patient in four different ways. namely (i) *Cradle method*, (ii) *Human crutch method*, (iii) *Pick-a-back method*, and (iv) *Fireman's lift method.*

(*i*) *Cradle method* : the helper will pass one of his hands—usually the right one—beneath the two knees of the patient and the other hand round the neck or back of the patient and will lift him. This method is only possible when the patient is lighter in weight in comparison to the strength of the helper. But this is not usually expected in the case of military personnel.

(*ii*) *Human crutch method* : In this method the helper stands at the side of the injured patient and holds the patient lightly by putting one hand round the waist of the patient and assists the patient by placing one arm of the patient round the neck of the helper and helper holds that hand firmly with his free hand



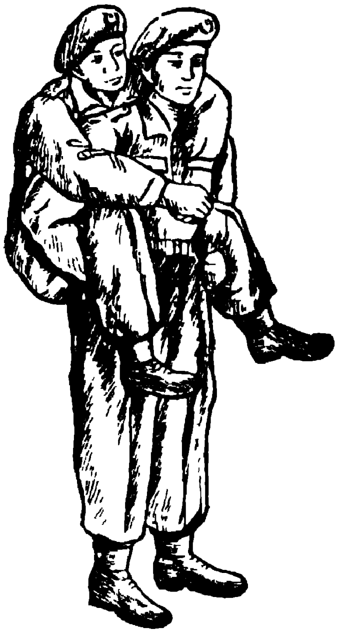
HUMAN CRUTCH

Fig. 52 : In this method the carrier stands by the injured side of the wounded man and assist the latter in moving.

This method is of great practical value in operations and also in other aspects of life.

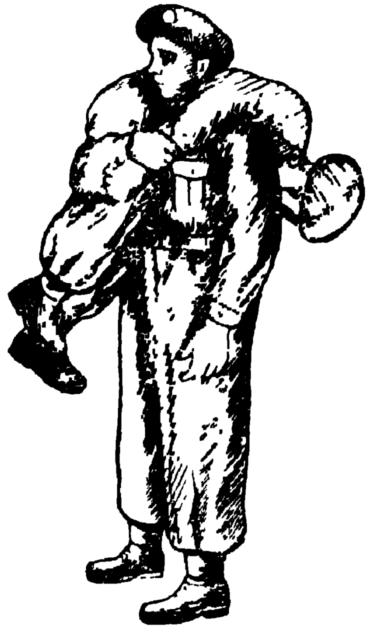
(*iii*) *Pick-a-back method* : In this method the helper carries the patient on the helper's back while the patient passes both his hands round the neck of the helper and holds himself while the helper holds by his two hands the knees of the patient.

In this method the patient can be carried quickly, provided the patient remains conscious. But there is also a risk in it—if the patient becomes unconscious on the way, the uncontrolled hands of the patient may cause suffocation of the helper.



PICK-A-BACK METHOD
Fig 53 : This method is used when the wounded person is able to hold on

(*iv*) *Fireman's lift and carry method* : In this method the helper grips the patient's right wrist with his left hand. Then he bends down with his head under the extended arm of the patient so that the helper's right shoulder goes in level with the lower part of the patient's abdomen. Then the helper passes his right hand usually between the legs of the patient and embracing the right leg of the patient takes the weight of the patient on the right shoulder of the helper and rises steadily to the erect position.



FIREMAN'S LIFT AND CARRY METHOD
Fig. 54 : Usually this method is used to carry an injured man.

Then the helper pulls the patient across both shoulders and transfers the patient's right wrist to the helper's right hand ; thus the left hand of the helper remains free.

In this method any man with average strength can usually lift any patient and the helper can move speedily to the aid post.

(B) Two man seats

Two helpers can carry a patient in four ways and can render more comfort to the patient. The methods are : (*i*) the two-handed-seat method, (*ii*) the three-handed-seat method, (*iii*) the four-handed-seat method and (*iv*) the fore and aft method.

(*i*) *The two-handed-seat method* : This method is mostly used when the patient is unable to assist the helpers by his own arms.

In this method the helpers stoop on the two lateral sides of the patient facing each other. Each of the helpers passes his one hand nearest to the patient's head under the patient's back just below the shoulders ; and in possible cases holds the patient's clothing. Then they slightly raise the patient and pass their other hands under the middle of the patient's body and grips each other's hand to form a straight rod like support under the patient's thigh. This grip is known as ***hook grip.*** Hook grip is formed in the following ways—the helper on the left of the patient keeps his palm upwards and holds a handkerchief to prevent hurting by finger nails and the helper of the right side keeps his palm downwards. Both the helpers rise steadily together and step off.

(*ii*) *Three-handed-seat method* : This method is used to support either of the lower limbs when the patient can assist the helpers by using his own hands.

The helpers stoop facing each other at the back of the patient. If the right limb of the patient is injured the helper on the patient's left side grips the lower part (nearing the wrist) of his own right fore arm with his left hand and the lower end of the other helper's left forearm with his right hand. The helper on the right grips the lower end of the first helper's left forearm with his left hand. This keeps the right hand free to support the patient's right limb.

If the left limb of the patient is injured the same procedure is to be followed substituting 'left' for 'right'.

After making the seat the helpers guide the patient to place one of the patient's arm round the neck of each helper and to place himself on the seat steadily.

As the patient places himself on the seat the helpers rise up steadily together and step off.

(*iii*) *Four-handed-seat method* : This method is used when the patient can assist the helpers by his own hands.

The helpers stoop at the back of the patient and grasp their own left wrists with their right hands and each others right wrists with left hands.

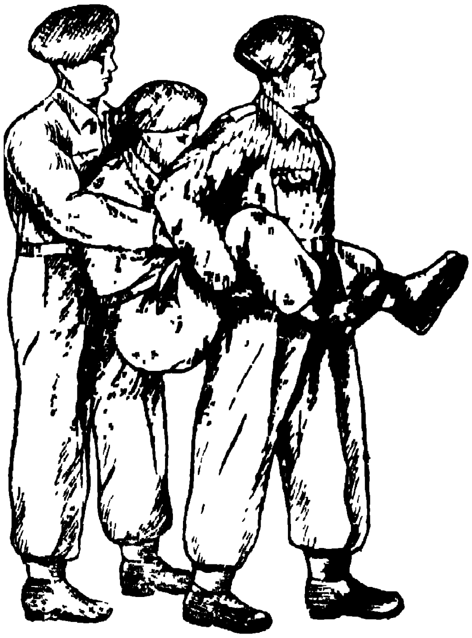
The helpers guide the patient to place one arm round the neck of each helper and to place himself on the seat steadily.

As the patient puts himself on the seat the helpers rise up steadily and step off.

(*iv*) *The fore and aft method* : This method is used when space does not allow to make a seat and carry the patient.

In this method one helper remains in the front and the other helper remains behind the patient.

The helper of the front holds by his two arms the knees or thighs, as the case may be, of the patient and looks forward. While the helper at the back holds by his two arms by the armpits of the patient or at the wrist holding the clothings of the patient or places his two hands at the back of the



FORE AND AFT METHOD

Fig. 55 : This method is used when the space does not permit of a hand seat.

patient near the scapulas depending on the condition of the patient.

7. Points to be noted

(*i*) In all methods of carrying by hand-seats the helpers step off with the cross-over step and not by side steps.

(*ii*) The paces of the steps of both the helpers must be equal.

(*iii*) Whether the helper will walk in steps or otherwise depends upon the position of the helpers in relation to the patient.

49

SOME FIRST AIDS

1. Introduction

First aid for all cases and accidents are not same, some of them have been described below.

(A) FIRST AID IN SNAKE BITE

There are approximately 300 species of snakes in India but 38 species are poisonous. They have got good hooked teeth which inject poison. The gland of poison is situated near the ear. Usually a snake presses the prey by the lower jaw and injects the poison. Snakes generally cannot stand erect more than 12" inches in height.

In snake bite immediate first aid is more important than the real treatment.

2. Precaution

To keep the snakes away from the residing place a trench of 18" × 18" inches should be made round the residing area. The trench must be smooth walled.

Spraying of carbolic acid is also very useful.

3. Equipment

For rendering first aid in snake-bite case everybody must always carry one blade or knife and at least 3 yards of string.

4. First aid

The guiding principle of first aid in snake-bite is to check the movement of the poison in the blood stream of the injured person and to drive out the poison-infested blood as soon as possible.

To ensure this the following steps should be taken—

(*a*) The man who is hurt should NOT move at all, because movement makes the circulation of blood speedier. He should better cry for help.

(*b*) The first aider should identify the snake in possible cases.

(*c*) Turnicates should be applied immediately to arrest the blood circulation round the arm or thigh (as the case may be) or few inches above or below *i.e.*, towards the heart, the wound.

Turnicate may be prepared by a string, rubber tubing or may be improvised by lanyard, puttee, puggri, neck tie or handkerchief with a stick or pebble.

After every 20 minutes the turnicate is to be relaxed for 30 to 60 seconds or until the skin becomes pink and again should be tightened. This procedure is to be repeated till the arrival of the doctor. This is done to minimise the possibility of gangrean formation in the place where turnicate is applied.

As soon as a patient is turnicated a 'T' is to be marked on the forehead of the patient clearly so that the doctor gets the idea of turnicate immediately.

(*d*) Immediately after applying turnicate the wound should be washed preferably with a very dilute solution of potassium permanganate in order to remove any venom which may have dried on the skin.

If potassium permanganate is not available any other antiseptic fluid can be used. If nothing is available washing can be done with plain water also.

During washing utmost care must be taken to ensure that the wound is NOT rubbed at all.

(*e*) Into the bitten area an incision of 3″ inches depth, 1″ inch length, should be made by fine blade or knife to allow the polluted blood to flow off. Ensure the skin round the wound has been well washed before cutting, otherwise poison may be introduced from the skin.

If no blood flows off the turnicate may be very slightly relaxed or suction may also be applied by any of the following ways: (*i*) sucking by dress pumps; (*ii*) common glass mildly heated can also be placed on the wound. Suction can also be done by oral sucking. There is NO danger in sucking off provided there is NO wound in the mouth.

(*f*) If the patient is able to swallow, give hot drink sweetend with sugar but NEVER administer alcohol.

(*g*) Keep patient warm and encourage him.

(*h*) Apply artificial respiration if the patient fails to breath normally.

5. Points to be noted

1. If the wound is in such a place that turnicate cannot be applied do NOT disturb the wound until the doctor arrives.
2. But washing or other steps should be taken.

(B) FIRST AID IN RABID ANIMALS' BITE

Dogs, jackals, foxes and wolves are the carrier of the viruses which cause hydrophobia, so if any of the aforesaid animals bites first aid should be administered immediately.

6. First aid

(*a*) If the wound is caused in any limb apply turnicate in the same fashion of snake bite.

(*b*) Keep the wounded part low so that blood can come out from the body of the patient easily.

(*c*) Wash the wound in the same fashion of snake bite.

(*d*) Give patient hot drinks.

(*e*) If the doctor does NOT come within a few minutes of the person being bitten, the wound) only the tooth marks) should be cauterized by a fluid caustic *e.g.*, carbolic acid, nitric acid, etc.

(*f*) A dry dressing may also be applied.

7. Point to note

The animal which has bitten should be kept under observation for a fortnight to see if it turns mad or develops signs of rabies.

(C) FIRST AID IN SUNSTROKE

Excessive temperature in dry seasons cause disturbance in the nervous systems.

8. First aid

(*a*) The patient is to be removed to shady and a cool place. But care should be taken to avoid sudden change in temperature.

(*b*) The dress of the patient should be made loose and shoes, socks, headgear, etc. should be taken off.

(*c*) Water should be sprinkled over the body of the patient.

(*d*) Whole body should be sponged until the body temperature comes down to 104°F.

(*e*) Then the whole body must be covered and the patient should be allowed complete rest for few hours.

50

HYGIENE AND SANITATION

1. Introduction

The science which deals with preservation of health—personal and public, is known as *hygiene*. In other language it means improvement of health and prevention from diseases. But *sanitation* is the art of keeping oneself and surroundings tidy and clean according to scientific methods. It comprises of proper healthy accomodation, supply of water, bathing arrangement, disposal of sewage and refuse.

2. Importance

Whenever there is a large collection of men there is always danger of infections and of contageous diseases *e.g*, skin diseases, cholera, dysentery, malaria, etc. In the life of defence services the risk is still greater as the people of these services are to go to all types of places and in any season. And the peoples are to come in close contact of each other on any and every time, so everybody must be free of communicable diseases and the living arrangements must be such so that no germ can come in the area nor can they settle.

3. Method

In dealing with the methods for proper hygiene and sanitation personal hygiene will be discussed first

(A) **Personal hygiene** : Personal hygiene mainly comprises of personal cleanliness. To keep oneself hygienically clean a few guiding points have been listed below.

(1) First of all one must keep one's body and clothes *clean* at all times.

(*a*) *Cleanliness of hair* : As the lice live in and lay their eggs in hair usually, one must always keep hairs clean. Undernoted methods may be followed for this purpose.

(*i*) *Trimming the hair short* : the maximum length of hair should NOT be more than 1½″ inches. Hairs near the neck region should be completely shaved. (*ii*) ***Hairs must be washed every day,*** if possible with warm water. It is advisable to use soap or shampoo at regular intervals. (*iii*) *Combing the hair* every day from time to time is essential to remove the superficial dirts.

(*b*) *Cleanliness of nails* : As dust particles harbour in the long nails these must be kept clean. For this purpose the following methods are suggested : (*i*) *trimming* the nails short ; (*ii*) *cleaning* the nails daily by a small brush or by any other material, and (*iii*) biting of the nails must be strictly prohibited.

(*c*) *Cleanlines of teeth* : As unclean teeth may lead to the development of a number of diseases, scrupulous attention must be given to the teeth. The following methods are suggested for the purpose : (*i*) *Cleaning* the teeth at every morning either by tooth brush and paste, or by tooth stick or by any sort of tooth powder. (*ii*) Cleaning the teeth with plenty of water after every meal or chewing betel-leaf. (*iii*) Cleaning the teeth with brush or any other suitable material before going to bed at night.

(*d*) *Cleanliness of the body and skin* : Every inch of the body and skin must be kept scrupulously clean, for which, the following methods are suggested—(*i*) *Bathing* daily, especially after games or other field works, with special attention to nape of neck, armpits, groins and space between toes and fingers, and (*ii*) washing the hands and mouth meticulously after every meal.

(*e*) *Cleanliness of clothes* : Clothes are meant for protection of body, and these come in most intimate contact with every inch of body surface So cleanliness of clothes is essential. Clothing must be washed every day. (*ii*) Towels and bed sheets of others must not be used ; if any other person uses them these articles must be washed.

(*f*) *Cleanliness of utensils :* Eating or drinking utensils must be washed and cleaned every day.

(*g*) *Rest* : To keep the body active periodical rest of both body and mind is essential. Rest is not wastage of time but is revival of energy to work more. This is best achieved by sleep. Usually for an adult on an average 7 to 8 hours' sleep is required daily.

(B) **Sanitation :** It will include all administrative measures and arrangements to keep the living places hygienic.

Here the places for military cantonment or camps are considered. But these points are equally true for any other type of camp or habitation.

(a) **The site**

(*i*) It should be preferably high, dry, sloping and shady place.

(*ii*) It should not be within a village or a town but must have at least one good approach from the main road.

(*iii*) Sufficient clear grounds should be kept adjoining the camp. Agricultural land, water-logged places, ponds or other places where flies can breed must be avoided.

(*iv*) The living place should be regularly sprayed with germicides, at least once in a month.

(*v*) It should be remembered always that per capita living space required during summer season is approximately 60 sq. ft. and during winter seasons 45—50 sq. ft.

(*vi*) Every individual should be meticulously careful in keeping the place tidy and clean.

(*vii*) The walls of rooms or tents must be cleaned or folded daily. Sufficient arrangements must made to allow fresh air and sunlight to enter inside the room or tent area.

(b) **Latrines**

(*i*) These should be suitably located on the leeward side of the residing place and must be at least 50 yards away but at the same time the maximum distance should be restricted within 200 yards from the most distant sleeping places.

(*ii*) In locating latrines care must be taken to see that the latrines are situated in such a place that there is NO chance of pollution of water supply and prevailing wind will not bring the strench into the residing place. In most part of India latrines should be situated either to the North or to the West of the site.

(*iii*) The number of latrines depend upon the number of residents—the standard ratio being 1 latrine for 6 to 8 heads.

(*iv*) Type of latrine depends upon the length of time of use. If the latrines are not to be used for more than 6 days 'shallow trench latrines' may serve the purpose ; but if the time of use extends for more than 6 days but less than two weeks 'bore hole latrines' will be required. If the time of use is more than two weeks then latrines of 'the water carriage system', 'aqua privy system,' or of 'the removal system' are to be constructed.

(*v*) Whatever may be the type of latrines they must be kept scrupulously clean at all times.

(*vi*) Lids should always be closed, when the latrines are not in use.

(*vii*) Drains from latrines should be connected either with a existing drainage system or to a soak pit, which is located far away from the residing place.

(*viii*) All latrines should be thoroughly sprayed inside and outside with lime, or other germicides at least once a week.

(c) Urinals

(*i*) These must be provided at convenient places for use during day and night. But NO urinal should be situated within 25 yards of living place. Sometimes peoples use pans for the purpose and the pans are either kept in the bed room or adjoining privy, but this practice is injurious.

All the urinals meant for day use should preferably be located near latrines.

(*ii*) The number of urinals depend upon the number of residents, the usual ratio being one urinal for 15 persons.

(*iii*) Urinals must be constructed in such a way so that there is NO chance of spoiling the ground.

(*iv*) All urinals must be kept clean, tidy and free from smell.

(*v*) All urinals must be sprayed with germicides at least once a fortnight.

(d) Cook houses and Dining places

(*i*) These should be located on the leeward side of the residing place but far away from the latrines and urinals.

(*ii*) There should be porper hearth or wovens and chimneys so that no smoke remains in the kitchen.

(*iii*) The kitchen floor should be cemented and good drainage system should be constructed so that no water or other liquid can be logged in or around the kitchen.

(*iv*) The floor should be swept cleanly and washed daily.

(*v*) Inside and outsides of cook house and dining places must be sprayed regularly with germicides at least once a week.

(*vi*) Cook house and dining places must NOT be used as store or for sleeping purposes.

(*vii*) All utensils and clothes *e.g.*, dusters, towels, etc. must be washed cleanly every day.

(*viii*) All prepared food must be covered and kept protected from flies or other insects and ants.

(*ix*) All kitchen refuse must be kept in properly lided refuse-bins.

(*x*) Cooks and helpers must be examined medically to ensure that they do not carry any disease and their hairs and nails are properly trimmed and clipped. The clothes of cooks and their helpers must be washed daily and be kept clean.

(e) Soakage and refuse pits

To destroy the liquid and solid refuses and garbage, soakage and refuse pits are to be constructed.

Soakage pit : For the disposal of liquid refuse soakage pits are to be made. Usually a soakage pit is digged according to the following measurement and pattern ; the length and width being 4 feet each, while the depth is 5 to 6 feet. But the size depends mainly on the volume of refuses to be destroyed. The lower part of the pit is filled with bigger stone-chips and broken bricks and the upper part is filled with smaller pieces of stones and bricks. The top of the pit should be covered with oiled sacking on which sand, shankers or earth must be kept at least of 6″ inches depth. Over this straw, grass or some other grease retaining material should be placed to retain the grease. The straw should be replaced daily by new stuff and the straw loaded with grease should be burried or burned.

Disposal of garbage : All dry refuse should be collected and thrown daily into the refuse pit or burnt at a place well away from the habitation. The refuse should be, at first, deposited in a bin placed outside the kitchen, dining hall and other places. Then all the refuses of the different places should be thrown in a deep trench which will be constructed at a considerable distance from the residing place. This trench will remain covered by some sort of lid prepared by matting, planks, etc. When this trench will be filled with refuse upto ¾th of its volume the trench should be closed by earth and a new trench should be digged for the purpose.

Disposal of stable litter : Cow dung, horse manure, etc. cause much nuisance and allow flies, insects, etc. to propagate. These should be daily collected and removed completely.

(f) Water supply

Supply of pure water is of paramount importance. Water may be obtained from (*i*) municipal water supply, (*ii*) reserve tanks or lakes, (*iii*) wells, (*iv*) rivers and streams, and (*v*) tube wells. Whatever may be the source, it must be ensured that the water is filtered and pure.

When water is collected from water supplies there is usually nothing to worry about.

If water is to be collected from reserve tanks, lakes or wells efforts must be made to ensure that the water is not only pure but the chances of accidental contamination are nil. Tanks and lakes can be protected from pollution by—(*a*) fencing the tank or lake, (*b*) prohibiting washing, bathing and any sort of cleaning works, (*c*) prohibiting grazing of cattle and other human habitation near tank or lake. (*d*) ensuring that there is no drainage or soakage of water in the tank. All these above mentioned measures are also required for protection of a well in addition to the following points : (*e*) there should be a dust proof cover at the top, (*f*) the well should be lined with stones or bricks set in concrete or cement. Wells must be at least 100 feet deep.

Rivers and streams, being continuously infested with different types of excreta, usually are not safe sources of water. If, in any case, water is to be collected from rivers or streams the particular points must be clearly demarcated.

Tubewell serves as good source of water supply.

When water is collected from any source but municipal water supplies, water must be examined bacteriologically before use and also must be chlorinated. If possible water should also be sedimented.

Water should be stored preferably in clean tanks. If tanks are not available other clean containers provided with covers can also be used. But sufficient care must be taken to ensure that no bacteria or worm can develop there. Medical Officer must test the water at frequent intervals.

(*g*) **Bathing places**

(*i*) Definite areas must be demarcated for the purpose of bathing if rivers, streams, tanks or lakes are to be used. Beyond that area no bather, however good swimmer he may be, will go.

(*ii*) Bathing places must be kept scrupulously clean.

(*iii*) Proper drainage system should be constructed in bathing places.

(*iv*) No used water should be allowed to settle in bathing places.

(*v*) Washing is not desirable in bathing places, but other places should be allotted for that purpose.

(h) Food and its storage

(*i*) Food, as much as possible, should be obtained fresh. Every commander must always remember that, 'army moves on stomach'.

(*ii*) The menu should be calorifically balanced, and tasteful dishes should be prepared. The menu must be changed from day to day.

(*iii*) Milk must be boiled.

(*iv*) Perishable food should preferably be stored in refrigerators or any other type of cold storage.

(*v*) All stores should be damp proof, rat proof, well ventilated and easily cleanable. These must be maintained hygienically.

(*vi*) Rotting of fresh vegetables or fruits must be prevented.

(i) Canteen

In canteen the following points must be treated with proper attention.

(*i*) Areas, adjoining and within the canteen, must be tidy, well ventilated and clean. Germicides should be sprayed at least twice a week.

(*ii*) Food must be prepared under proper hygienic conditions and cooks and cook houses must conform to the standard rules mentioned above.

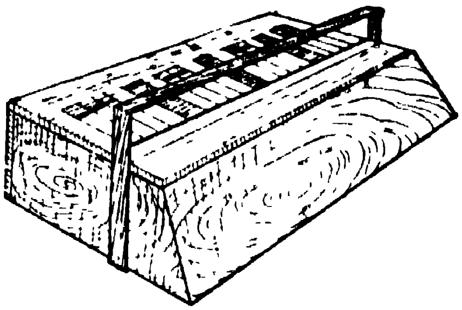
(*iii*) Utensils must be properly sterilized.

(*iv*) Food must be protected from flies, insects and dust by all means.

(*v*) Barber's tools and utensils must be kept sterilized always.

Types of latrines

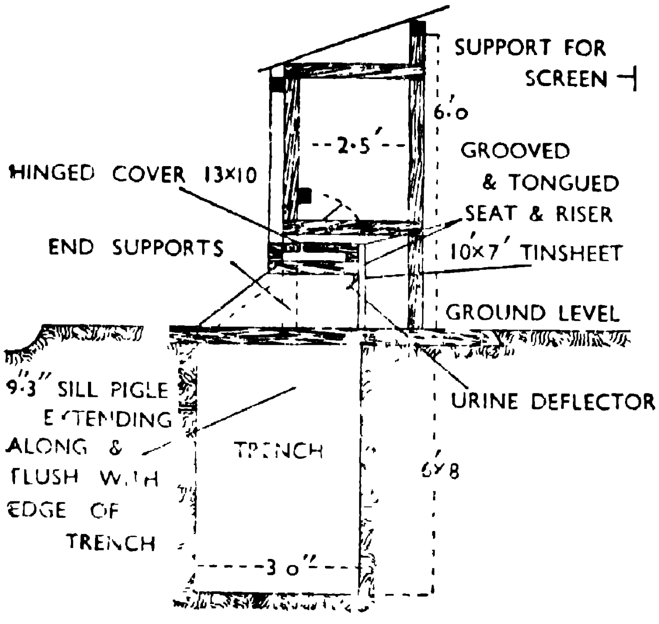
(*i*) *Shallow trench latrine* : This system consists of parallel rows of trenches ; each trench being of the measurement—length 3 feet, width 1 feet and depth 2 feet. Each trench should be 2 feet apart.



SHALLOW TRENCH LATRINE

Fig. 56 : This type of Latrine is useful only in temporary camps

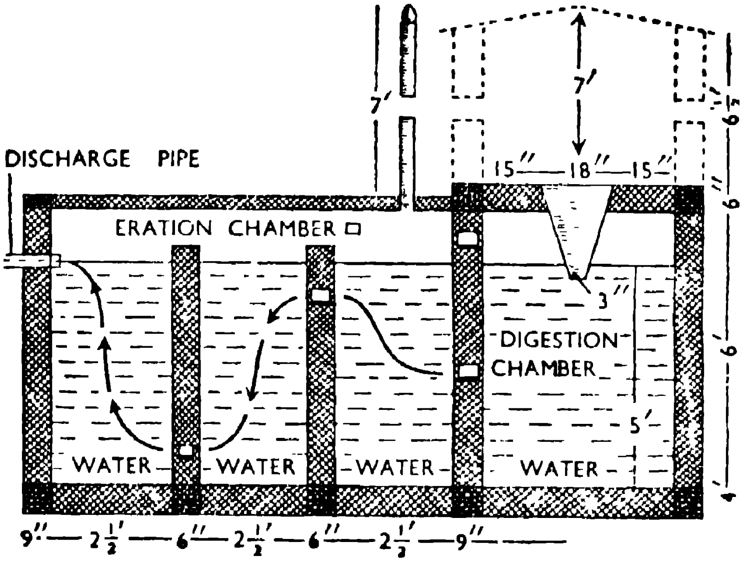
(*ii*) *Deep trench latrine* : In this system each trench is 3 feet wide, the depth varies from 8 feet to 12 feet and the length varies according to suitability. Over this trench wooden cover with 1 feet × 8 inches holes should be placed. These holes must have properly fitted lids. If the soil is such that there is some danger of the sides collapsing they should be revetted with wooden pieces, bamboos, sand bags, etc The ground for certain distance all round the trench should be dug to a depth of 3 inches and the loosened soil removed Usually fly proof wooden structure is placed on the trench.



DEEP TRENCH LATRINE

Fig. 57 : This type of latrine is installed in permanent or semi-parmanent camps.

(*iii*) *Bore hole latrine* : In this system a small well is dug down the latrine, according to the following measurement —radius of the hole varies from 7 inches to 9 inches and the depth must go at least 2 feet below the sub-soil water.



AQUA PRIVY LATRINE

Fig. 58 : This type of latrine can be erected at a nominal cost in semi-permanent or permanent camp.

(*iv*) *The water carriage system* : In this system the excreta are washed and carried away by sufficient flow of water to disposal trenches. It is simple and hygienic but the initial cost is considerable.

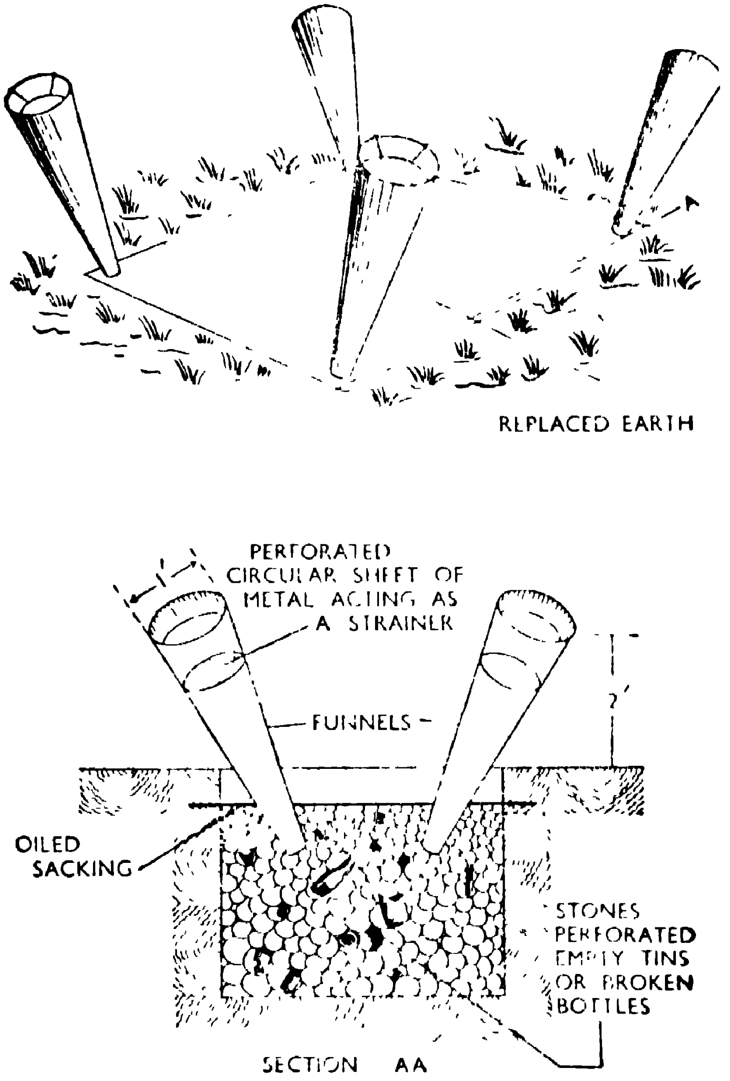
(*v*) *Aqua privy system* : This system is a modified sewage system. In this system several interconnected cisterns of measurement 6 feet by 4 feet are to be constructed. All these cisterns should be filled with water leaving some space for air at the top of the cisterns.

(*vi*) *Removal system* : This is a very simple but not very hygienic method. In this system perforated troughs are placed over tins or tanks. The solid excreta are collected on the troughs while liquids are collected on tins or tanks and subsequently removed from the house for final disposal.

Types of urinals

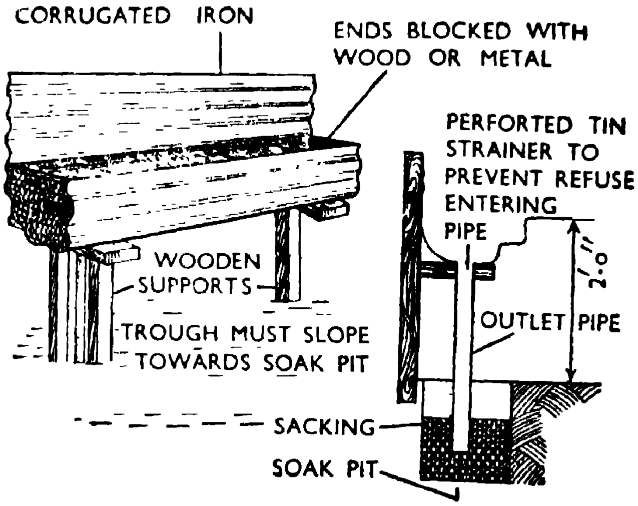
(*i*) *Funnel urinal* : Funnel urinals are easy to construct. This is a funnel provided with a sieve plate and fixed on a soakage pit.

(*ii*) *Trough urinal* : This type of urinal is constructed by corrugated or plain galvanised tin, bent in the form of a channel


REPLACED EARTH
PERFORATED CIRCULAR SHEET OF METAL ACTING AS A STRAINER
FUNNELS
2'
OILED SACKING
STONES PERFORATED EMPTY TINS OR BROKEN BOTTLES
SECTION AA

FUNNEL URINALS AND SOAKAGE PIT

Fig. 59 : Funnel urinals can be easily constructed for temporary use over a soakage pit. Top—funnel urinals as seen from outside ; Bottom—sectional view showing the soakage pit, which is filled up with stones, perforated empty tins, broken bottles, etc.


CORRUGATED IRON
ENDS BLOCKED WITH WOOD OR METAL
PERFORTED TIN STRAINER TO PREVENT REFUSE ENTERING PIPE
2'0"
WOODEN SUPPORTS
OUTLET PIPE
TROUGH MUST SLOPE TOWARDS SOAK PIT
SACKING
SOAK PIT

TROUGH URINAL

Fig. 60 : Usually this type of urinal is constructed at nominal cost for community use. Left—full view of the urinal ; Right—sectional view of the same showing passage of urine to the soakage pit.

and mounted on four legs. This tray slopes gradually towards one end where a vertical pipe runs to a soakage pit.

(*iii*) *Shallow trench urinal* : A shallow trench of 15 feet to 20 feet length, 3 feet width and 1 feet depth with loosened earth may serve the purpose for temporary use.

(*iv*) *Icelandic lily urinal* : It consists of a perforated petrol tin fitted with a soakage pit.

Hygiene in connection with march

Marching makes body and clothing of men dirty and ragged. So care must be taken to ensure that for the reason of exhaustion no one falls sick or ill.

(1) *Hygiene before march*

(*a*) Everybody must be examined by the medical officer.

(*b*) Feet, boots and socks should be clean and dry. Socks and boots must fit in comfortably. It is advisable to use always slightly bigger boot.

(*c*) Leather of boots should be softened by dubbin.

(*d*) Before starting for a long march every one must take light meal, visit the latrine and take slight rest.

(*e*) Every one must carry water bottle completely filled with pure drinking water.

(*f*) Total load of an individual should NOT exceed ⅓rd of one's own body weight.

(2) *Hygiene during march*

(*a*) Usually the speed of march should be 100 yards per minute or in other words 3 miles per hour.

(*b*) After first 50 minutes' march a rest of 10 minutes must be allowed, and in subsequent hours rest of 5 minutes will do.

(*c*) During these rest periods peoples must NOT put off the boots ; but must keep the feet upwards.

(*d*) Strict water discipline must be maintained during these rest periods.

(*e*) Nobody should drink water during march.

(3) *Hygiene after march*

(*a*) No one should take water immediately after a long march. Hot stimulating drinks like tea may be served.

(*b*) After putting off the boots, feet must be examined for blisters and sores.

(*c*) All the muscles should be massaged lightly.

(*d*) Sudden exposure to cold must be avoided.

(*e*) If possible, the feet should be dipped in lukeworm saline water.

(*f*) Socks must be washed.

(*g*) After sufficient rest everybody must take bath and use soap during bath. Remember, *personal hygiene is personal responsibility.*

To prepare the manuscript the editor has consulted the following books and journals :

1. Indian Armed Forces Year Book (1957, 1958) edited by Jaswant Singh.
2. Organization and Administration in the Indian Army by Brig. Rajendra Singh, p.s.c.
3. (*a*) Text Book of Military Science Vol. I. by Maj. Shiam Lal & Mukherjee, P. K.
   (*b*) Text Book of Military Science Vol. II. by Maj. Shiam Lal & Mukherjee, P. K.
4. A Practical guide to Weapon Training and Good Shooting. by Lt. Col. Gurbans Singh, p.s.c.
5. Small Arms of the World by W.H.B. Smith.
6. A Hand book of Weapon Training by Lt. Col. G. E. Thornton, O.B.E.
7. Guide to Certificate 'A' (Part one, two, three, four and five) By Brian M. Forrest, T.D.
8. Soldiers and Soldiering by Field Marshal Earl Wavell.
9. Tactics by General Carl Von Clausewitz.
10. Britain's Fighting Forces by Capt. Ellison Hawks, R.A.
11. Defeat into Victory by Field Marshal Sir William Slim.
12. The Essentials of Military Knowledge by Lt. Col. D. K. Palit.
13. Command Voice by Capt. R. W. Sharrethes.
14. Weapons and Tactics by Wintringham.
15. First Aid to the injured (1958) by the St. John Ambulance Assn. (India)
16. Principles of War by General Carl Von Clausewitz.
17. Basic Training Guide (1951) by Military Service Publishing Company, Harrisburg, Pennsylvania.
18. Home Guard Mannual of Camouflage by Roland Penrose.

19. Field Service Regulations Vol II Published by His Majesty's Stationary Office (1935).
20. The Wonder Book of the Army Published by Ward, Lock & Co.
21. Small Unit Tactics—Infantry, Published by Military Service Publishing Company, Harrisburg, P.A.
22. We shall fight in the streets by Capt. S. J. Cuthbert.
23. The Art of War by Sun Tzu-Wu
translated by Lionel Giles
published by Military Service Publishing Company, Harrisburg, Pennsylvania.
24. Operation Victory by Maj. Gen Francis de Guingand.
25. Memoirs of Montgomery by Field Marshal Montgomery.
26. Technique of Getting Things Done by Laird & Laird.
27. Lecture Notes of Lt K. S. Chatterjee. M. Sc , B. Com.
28. The Road Past Mandalay by John Masters.
29. U. S. I. Journal.
30. Sainik Samachar.
31. The Cadet.

SOME IMPORTANT QUESTIONS

A. Citizenship

1. Write short notes on good citizenship and duties of a citizen in a national emergency.
2. 'The citizen armies of the French Revolution were ill-clad, ill-trained and ill-equipped. Yet they could hold their own against the well-equipped and well-trained armies of Europe'. What in your view were the reasons for this ?

B. Leadership

1. The 'Desert Fox' met Wavell, Auk, Monty and Ike in North Africa. Compare their qualities as military leaders.
2. Describe with diagrams the badges of ranks of the following Army Officers along with those of equivalent ranks in the Navy and Airforce : (*a*) Lieutenant, (*b*) Captain, (c) Brigadier, and (*d*) Major General.

C. Weapons and chemicals

1. Explain any four of the following terms : Line of fire, Ricochets, First catch, Axis of the barrel, First graze, Culminating point.
2. Explain any four of the following terms : Jump, Dangerous space, Line of departure. Trajectory, Fixed line of Fire, Elevation.
3. Briefly describe the main characteristics of L.M.G., with special notes on the following points :
   - (*a*) Weight and length of the Gun Mks. III and IV.
   - (*b*) Weight of a magazine—both filled and empty.
   - (*c*) Weight and length of the barrel of Mks. I and II.
   - (*d*) Rates of fire.
4. Give a short description of the characteristics of the various types of Grenade or 2″ Mortar.

5. Give short answers of the following :
   - (*a*) Weight of Bren Gun (Mks. III and IV).
   - (*b*) Weight of empty magazine of L.M.G.
   - (*c*) Cyclic rate of fire—L.M.G.
   - (*d*) Why Sten Gun is called a C.Q.B. weapon ?
6. Explain the various types of War Gas noting the characteristics and effects of each one of them. Can you suggest remedies ?
7. Give a short description of the characteristics of Sten Gun (Mks. I and II).

D Organizations

1. Give a general outline of an Inf, Bn. with detailed organization of personnel and weapons of a Platoon of a Rifle Coy.
2. Give detailed account of an Infantry battalion in NCC organization noting its personnel with their ranks.
3. What is Section Formation ? How many formations are there ? Name and explain each one of them describing the suitability of the ground in each case.
   Name the weapons of a section of an Inf. Bn. mentioning the persons carrying them.

E. Field Craft

1. What is Field craft ? Explain clearly why its importance has been increasing steadily.
2. What is cover and camouflage ? Describe the various types of cover and their use. What important points are kept in view in camouflaging ?
3. (*a*) Discuss the points which should be kept in view in selecting line of advance.
   (*b*) Analyse the essentials of a good firing position.
4. What do you mean by Patrols ? How many types of Patrol are in use now-a-days ? Define and distinguish between the different types of Patrols. Explain the strength and special features of any one of them.

5. What do you understand by 'Reconnaissance' ? What points need special attention before a leader sets out for reconnaissance ? Describe the sequence and steps involved in an order for a Recce Patrol.
6. Describe the duties of a Sentry. Explain and illustrate the points which a Sentry must know ?
7. Describe a complete Verbal Order noting its sequences and steps.
8. What is Fire Control Order ? Give illustrations of 'Full Fire Order' and 'Delayed Fire Order'.
9. Explain the essential features of Message Writing. What is Security classification in Messages ? Explain each class.
10. Discuss the various factors which govern the 'Appreciation' of a situation. Bring out the important points which you would bear in mind in discussing the factors.

F. War—principles and operations

1. Describe the principles of 'Economy of Force', 'Strategic Offensive', and 'Security', and illustrate them from your study of Military History.
2. What do you understand by 'the principles of Economy and Security' ?
3. 'Defence is delayed attack'. 'Defence must always be offensive'. Discuss.
4. Comment on the definition of strategy given by Clausewitz· In what way does Moltke differ from him and why ?
5. Bring out the significance of the statement, "Speed is Armour".
6. 'Strategy is the art of projecting campaign. Tactics is the art of handling forces in battle'.

   State, discussing the definitions given by various military writers, how strategy differs from tactics.
7. Explain 'any two' of the following—

(*i*) 'The speed and efficiency of a practical action depends on an early and adequate Recce'.

(*ii*) 'Security, in a war, is a complex problem calling for a compound situation.'

(*iii*) 'In the Middle Ages the warfare represented the fulfilment of a religious and moral duty'.

(*iv*) 'Victory is to him who has the last reserve'.

8. 'The essence of modern warfare is reconnaissance and surprise'. Comment on this statement, justifying it by examples from the World War II.

9. The essence of modern warfare is 'Speed'. Enlarge this statement in light of World War II or Kashmir Campaign.

10. 'Modern warfare is the co-ordination of infantry, airforce and other arms of the services'. Comment on this statement, justifying it by examples.

11. What are the Principles of War ? Describe and explain some of the important principles illustrating them in the different phases of a Platoon in Attack.

12. 'Selection and Maintenance of Aim' is one of the Principles of War. Can you give an illustration of the application of this principle from any small campaign you are acquainted with ? Explain your illustration.

13. What is the contribution of World War I in the field of tactics ?

14. Write short notes on (*a*) Fog of War ; (*b*) Mobile Defence ; (*c*) Reserves ; (*d*) Rockets ; (*e*) Combined Operations.

15. What are the guiding principles of withdrawal ? Describe the different stages of a Platoon's withdrawal.